BM3

Patient Monitor

Service Manual

Rev A



Table of Contents

1. How to Reach Us …

The following are telephone numbers and addresses for contacting various service, product supplies and sales personnel

Product and Purchase Inquiry

Bionet Co., Ltd.

Address #188-5, KiCOX venture center 501, Guro-dong, Guro-gu, Seoul,

South Korea (ZIP 152-050)

Overseas sales dept. Tel:++82-2-6300-6419

Service call

Tel: ++82-2 –6300 - 6431

Technical support

For any technical questions or problems on the equipment, call;

Tel: ++82-2 –6300 - 6431

Web site of Bionet

URL : **HTTP://** **WWW.BIO2NET.COM**

※ In the event of a malfunction or failure, contact Service Dept.Of Bionet Co., Ltd along with the model name, serial number, date of purchase and explanation of failure.

Warranty

- This product is manufactured and passed through strict quality control and thorough inspection.
- Compensation standard concering repair, replacement, refund of the product complies with “ Consumer’s protection law” noticed by Economic Planning Dept.

Warranty period is 2 year.

- Warranty repair or replacement will be made by Bionet Service Center at no charge for warranty period if properly used under

normal condition in accordance with the instructions for use.

- Manufacturer or sales agency takes no responsibility for any kind of damage or breakdown that is caused by misuse and failure to maintain the equipment.

2. General Precaution

Warning, Caution, Note

- For a special emphasis on agreement, terms are defined as listed below in operation manual. Users should operate the equipment according to all the Warning and Caution.

Warning : To inform that it may cause serious injury or

death to the patient, property damage, material losses

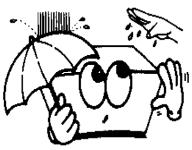
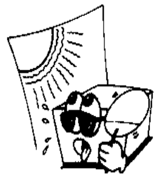
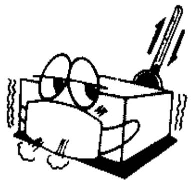
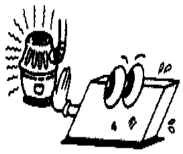
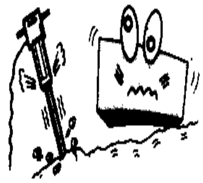
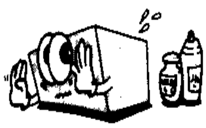
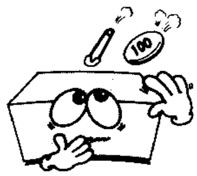
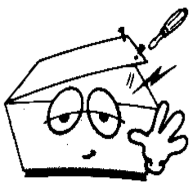
against the “Warning”sign.

Caution: To inform that it may cause no harm in life but lead to injury against the “Caution”sign.

Note : To inform that it is not dangerous but important for proper installation, operation, and maintenance of the equipment.

General Precaution on Environment

- Do not keep or operate the equipment in the environment listed below.

	Avoid placing in an area exposed to moist. Do not touch the equipment with wet hand .		Avoid exposure to direct sunlight
	Avoid placing in an area where there is a high variation of temperature. Operating temperature ranges from 10℃ to 40℃. Operating humidity ranges from 30% to 85%.		Avoid in the vicinity of Electric heater
	Avoid placing in an area where there is an excessive humidity rise or ventilation problem.		Avoid placing in an area where there is an excessive shock or vibration.
	Avoid placing in an area where chemicals are stored or where there is danger of gas leakage.		Avoid being inserted dust and especially metal material into the equipment
	Do not disjoint or disassemble the equipment. Bionet Co.Ltd takes no responsibility for it		Power off when the equipment is not fully installed. Otherwise, equipment could be damaged.

General Precaution on Electric Safety

Warning: Check the item listed below before operating the equipment.

1. Be sure that AC power supply line is appropriate to use.
   (AC 100 - 240V)

2.Be sure that the power source is the one supplied from Bionet.
   (DC 18V, 2.5A)

3.Be sure that the entire connection cable of the system is properly and firmly fixed.

4. Be sure that the equipment is completely grounded.(Otherwise, noise could result.)

5. The equipment should not be placed in the vicnity of electric generator, X-ray, broadcasting apparatus to eliminate the electric noise during operation. Otherwise, it may cause incorrect result.

NOTE
The Equipment should be placed far from generator, X-ray equipment, broadcasting equipment, or transmitting wires, so as to prevent the electrical noises from being generated during the operation, When these devices are near the Equipment, it can produce inaccurate measurements. For BM3, both independent circuit and stable grounding are essentially required. In the event that same power source is shared with other electronic equipment, it can also produce inaccurate output

Warning
Do not use the System for any monitoring procedure on a patient if the monitor is not working properly, or of it is mechanically damaged. Contact the hospital biomedical engineer, or your supplier

NOTE
BM3 is classified as follows. : - It is a class I type-CF Class equipment in terms of electrical shock prevention. It is not proper to operate this Equipment around combustible anesthetic or dissolvent. - The noise level is “B” Class according to the IEC/EN 60601-1 (Safety of Electric Medical Equipment), and the noise redemption is “B” Level according to the IEC/EN 60601-1-2 (Electromagnetic Compatibility Requirements).

Equipment connection

CAUTION
In the hospital, doctors and patients are expose to dangerous, uncontrollable compensating currents. These currents are due to the potential differences between connected equipment and reachable conducting parts often in the medical rooms. The safety solution to the problem is accomplished with consistent equipment

Maintenance and Cleaning

Using various methods can clean BM3 and its accessories. Please follow the methods mentioned below to avoid unnecessary damage or contamination to the Equipment.

In the event that harmful (unauthorized) materials are used for cleaning, the damaged or contaminated Equipment shall not be serviced without charges regardless of warranty period.

Caution!
Please check carefully both frame and sensor, after cleaning the Equipment, Do not use the Equipment that is worn out or damaged.

At least once a month, clean and wipe off the frame by using the soft cloth after wetting it with lukewarm water and alcohol. Do not use lacquer, thinner, ethylene, or oxides, which could be harmful to the Equipment.

Make sure both cables and accessories are free of dust or contaminants, and wipe them off with soft cloth wetted with lukewarm water(40℃ / 104℉), and at least once a week, clean them by using the clinical alcohol.

Do not submerge the accessories under any liquid or detergent. Also, make sure any liquid not to penetrate into the Equipment or probe.

Caution!
Do not dispose single use probe to any hazard place, Always think about environmental contamination

Caution!
There is back-up battery on board inside system. When users dispose this chip. Please waste proper place for environmental protection CR2032 3.0Volt battery

Warning: Check the electrodes of batteries before changing them.

3. Performance Specification

Ease of use

• Battery operation

- Optional integrated strip chart recorder
- mounting to a roll stand supports bedside availability

Customization

- Tabular and Graphical Trends
- Compatible with Nellcor reusable and disposable SpO2 sensors

Special Features

- Direct DC input for transport needs
- LAN data export interface
- Nurse call alarm capability

Monitor Environmental Specifications

- Operating Temperature: 0°C to 50°C (32°F to 122°F)
- Storage Temperature: - 20°C to 60°C (- 4°F to 140°F)
- Operating/Storage Humidity: 5% to 95% RH, non-condensing
- Operating Altitude: 0 to 3,048 m (0 to 10,000 ft.)

Power

- 18 VDC, 2.5 A max , Adapter

Monitor Performance Specifications

- Display:
  - LCD 5.7” color
- Indicators
  - Up to 3 waves (ECG, SpO2, Respiration)
  - categorized alarms (3 priority levels)
  - visual alarm
  - heart rate tone
  - battery status
  - external power LED

- Interfaces
  - DC input connector: 10 to 16 V DC, 3A max.
  - Defib Sync Output
    Signal Level: 0 to 5 V pulse

Pulse Width: 100 ±10 ms
Delay from R-wave peak to start of pulse: 35 ms, maximum
Short circuit current: 15 mA Minimum required R-wave amplitude: 0.5 V

- LAN digital output for transferring data to an external computer
- nurse call

• Battery (standard)
  – internal battery: sealed lead-acid
  – battery status indicator
  – Operating Time: 2.5 hours typical (fully charged battery)

• Thermal Printer (Optional):
  – Speeds: 25, 50 mm/sec
  – Paper Width: 58 mm

Graphical and Tabular Trends

• Tabular Trends
  – Memory Storage: 24 hours
  – Data Interval: 1 minute
  – Display Interval: 1MIN, 5, 15, 30, 1HR
  Tabular Format: One table for all variables

• Graphical Trends
  - Display Period: 30MINS, 60, 90, 3HRS, 6, 12

SpO_2 Performance Specifications

• % Saturation Range: 0% to 100%
• Pulse Rate Range: 30 to 300 bpm
• SpO2 Accuracy: 70% to 100% ± 2 digits, 0% to 69% unspecified
• Pulse Rate Accuracy: ± 3 bpm

NIBP Performance Specifications

• Technique: oscillometric
• Measurement Modes:
  – Manual:Single measurement
  - Auto:Automatic intervals of 1MIN,2,3,4,5,10,15,20,30,1HR,2,4,8
• Cuff Pressure Display: 30 to 300 mmHg
• Blood Pressure Measurement Range:

– Systolic: 60 to 250 mmHg
– Mean Arterial Pressure: 45 to 235 mmHg
– Diastolic: 40 to 220 mmHg

• Pulse Rate Range: 40 to 200 bpm

ECG Performance Specifications

• Leads: 3 leads
• Heart Rate Range: 30 to 300 bpm
• Heart Rate Accuracy: ± 3 bpm
• Bandwidth: 0.5 Hz to 40 Hz
• Display Sweep Speeds: 25mm/sec
• ECG Size (Sensitivity): 0.5, 1, 2, 4 mV/cm
• Lead-Off Detection with display indicator
• Pacemaker Detection Mode: Indicator on waveform display, user selectable
• Differential Input Impedance: > 5 Mohm
• Common Mode Rejection Ratio: > 90 dB at 50 or 60 Hz
• Input Dynamic Range: ± 5 mVAC, ± 300 mVDC
• Defibrillator Discharge: <5 s
• Defibrillation Artifact Recovery Time: < 8 s

Respirations Performance Specifications

• Range: 5 to 120 breaths/min
• Accuracy: ± 3 breaths/min
• Display Sweep Speeds: 25mm/sec

Temperature Performance Specifications

• Range: 15°C to 45°C (59°F to 113°F)
• Accuracy: 25°C to 45°C ± 0.2°C, 15 °C to 24°C ± 0.3°C
• Compatible with YSI Series 400 Temperature Probes

Accessories included:

- 3-lead patient cable	1ea
- electrodes	10ea

- NIBP tubing, 3 m long 1ea
- Adult cuff, 25-35 cm, reusable 1ea
– SpO2 sensor extension cable(2 m) 1ea
– SpO2 sensor, reusable 1ea
– DC adapter, 18VDC, 2.5A 1ea
- Temperature probe Surface/Skin, reusable(OPTION)
– rolls of paper. (OPTION)
- 5-lead patient cable(OPTION)

4. Equipment Overview

Overview of the Product

BM3 monitor is a product used for monitoring biological information and

occurrence of a patient. Main function

ns of the product include displaying information such as ECG, respiration, SpO2, NIBP and temperature on its LCD screen and monitoring parameter, and alarming. It also prints out waves and parameters via a printer.

Features of the Product

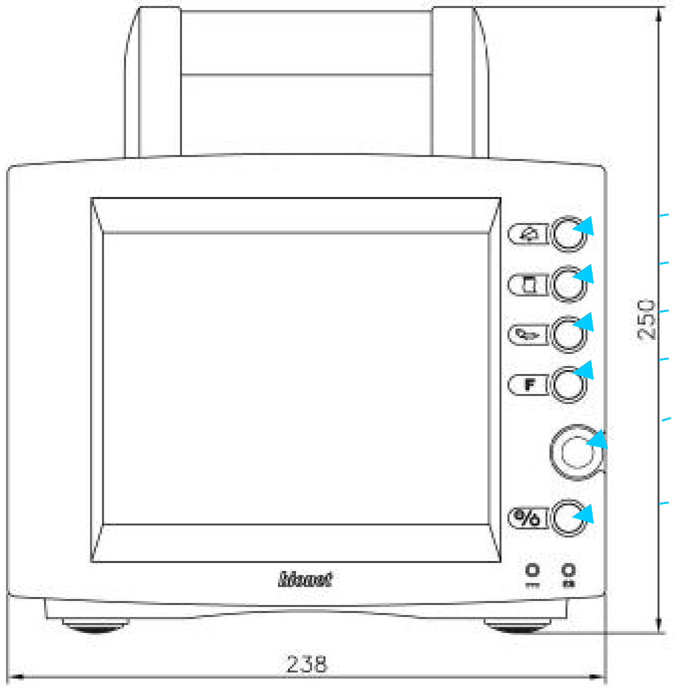
BM3 is a small-size multifunctional monitoring equipment for a patient designed to an easy usage during movement. It features devices for auto power supply (DC 10V-16V) and DC power supply (DC 18V) as well as installing its handle to the patient's bed. The equipment also measures major parameters such as ECG, SpO2, NIBP, temperature and pulse, displaying it on a 5.7-inch color LCD screen. It also enables users to check waves and parameters and other vital signs of a patient via the 58mm thermal printer and monitor the patient by the remote-controlled alarm system. It also enables to build a central monitoring system by linking devices used for separate patients so that one can monitor several patients at a time.

Warning
In order to avoid electrical shock, do not open the cover. Disassembling of the Equipment have to be done only by the service personnel authorized by [illegible]

BiONET Co. Ltd.

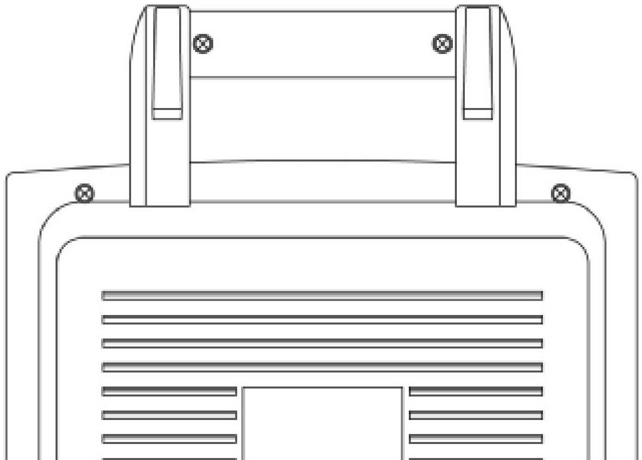
Warning
Users must pay attention on connecting any auxiliary device via LAN port or nurse calling. Always consider about summation of leakage current, Please check if the auxiliary device is qualified by IEC 60601-1, or consult your hospital biomedical engineer

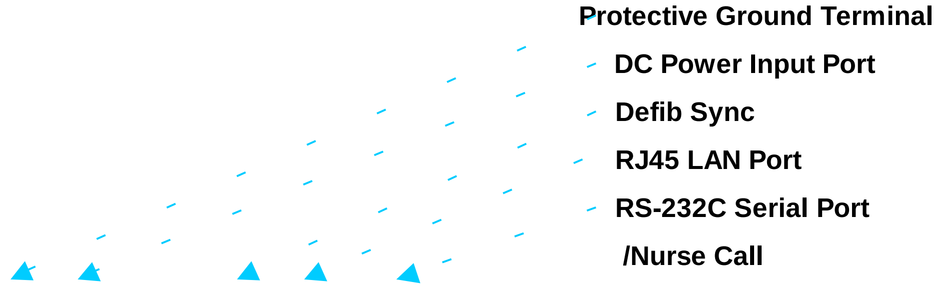
Features of Main Body



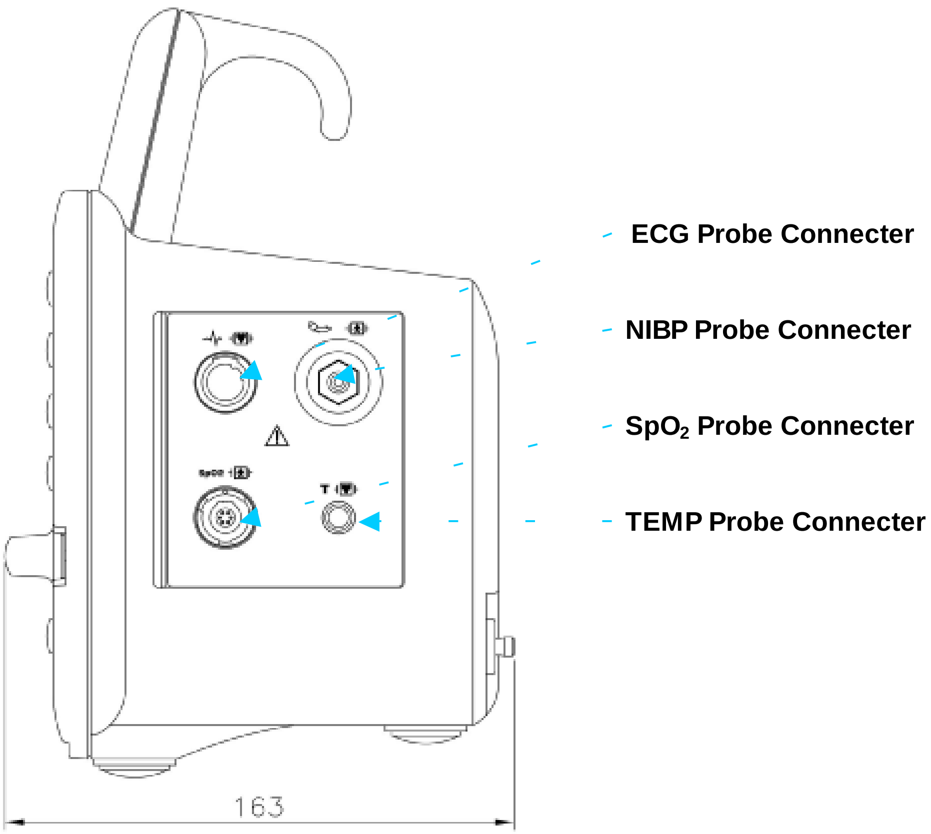
- SILENCE ALARM KEY
- PRINT GO/STOP KEY
- NIBP GO/STOP KEY
- FUNCTION KEY
- TRIM KNOB CONTROL KEY
- POWER KEY

Front

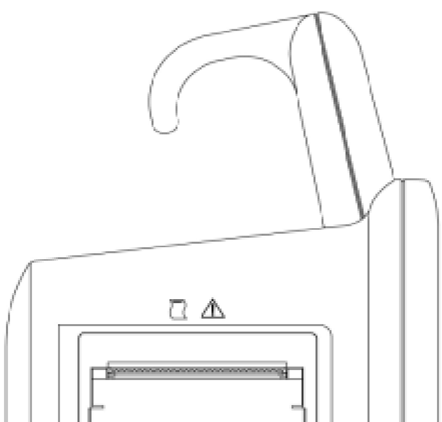




Back



▲ Right side ▼ Left side



PRINTER

Accessories



ECG Cable



ECG wire



SpO2 Cable



SpO2 Extention cable



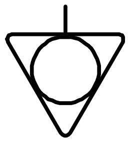
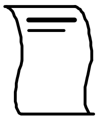
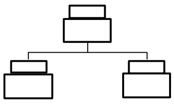
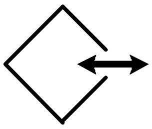
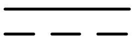
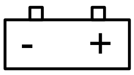
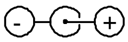


(option) Temperature Cable

NIBP CUFF **TEMP(OPTION)**

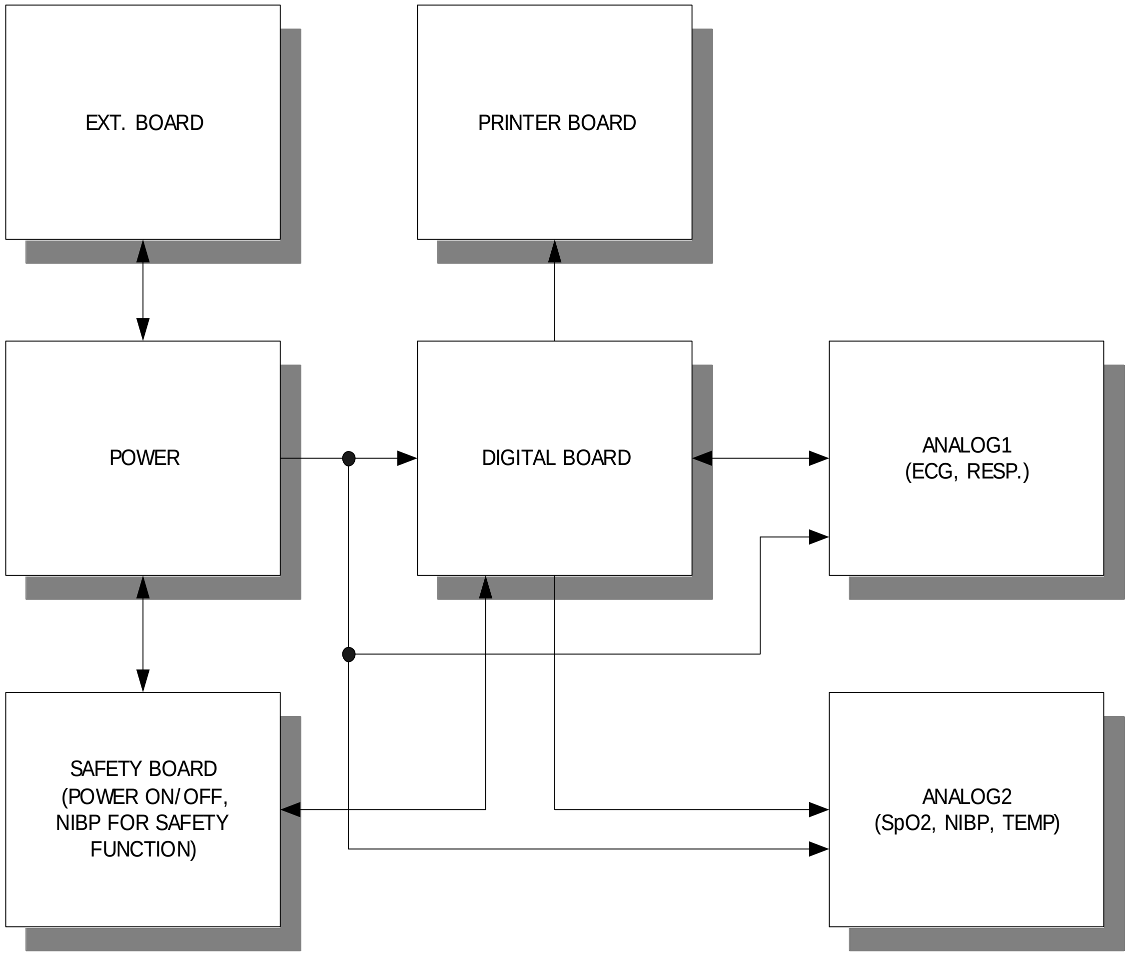
Equipment Symbols

	ATTENTION : Consult accompanying documents
	TYPE CF APPLIED PART : Insulated (floating) applied part suitable for intentional external and internal application to the patient including direct cardiac application. “Paddles” outside the box indicate the applied part is defibrillator proof. Medical Standard Definition : F-type applied part (floating/insulated) complying with the specified requirements of IEC 60601-1/UL 2601-1/CSA 601.1 Medical Standards to provide a higher degree of protection against electric shock than that provided by type BF applied parts.
	TYPE BF APPLIED PART : I Insulated (floating) applied part suitable for intentional external and internal application to the patient excluding direct cardiac application. “Paddles” outside the box indicate the applied part is defibrillator proof.

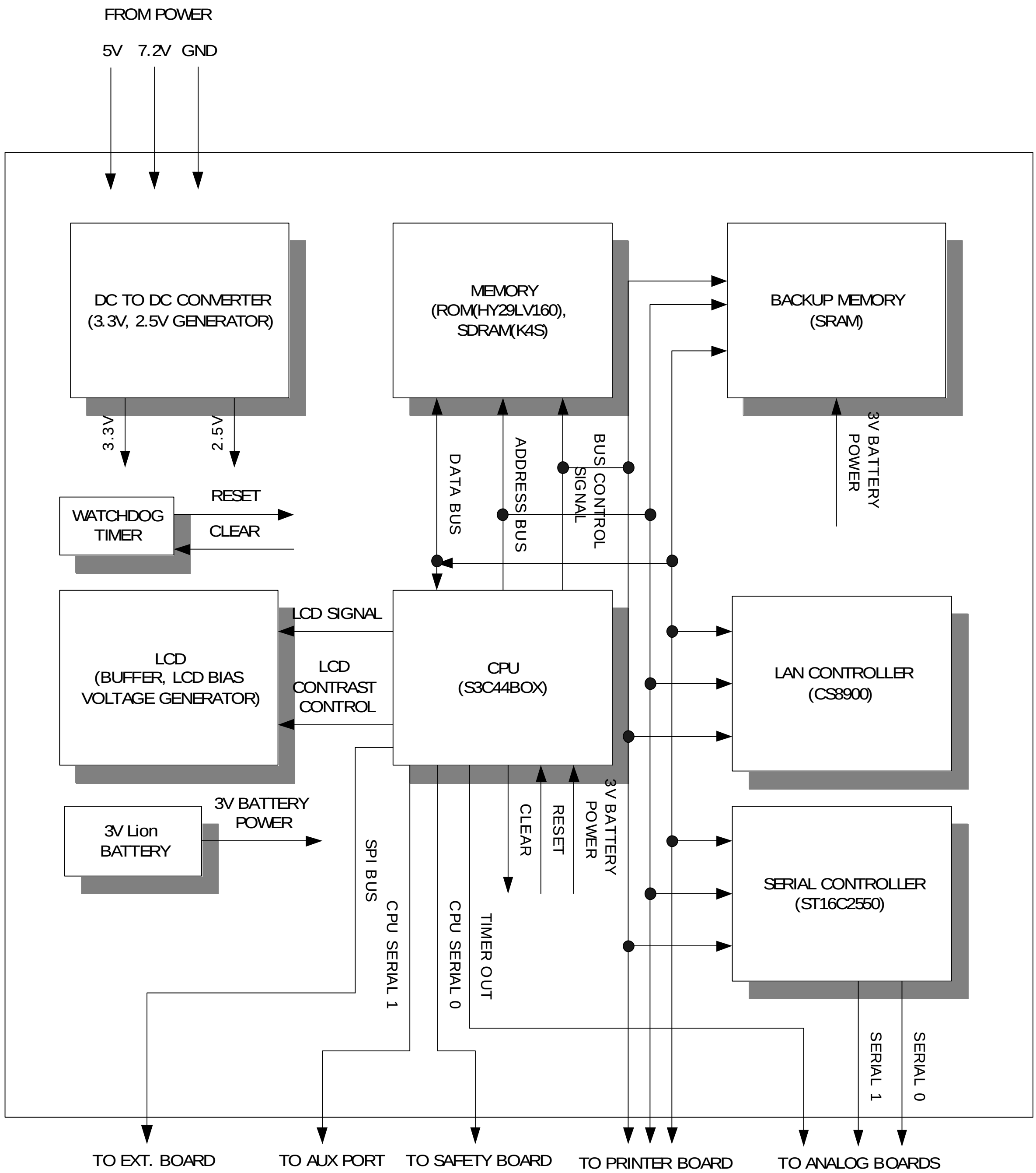
	Medical Standard Definition : F-type applied part (floating/insulated) complying with the specified requirements of IEC 60601-1/UL 2601-1/CSA 601.1 Medical Standards to provide a higher degree of protection against electric shock than that provided by type B applied parts.
	Equipotentiality
	PAPER
	RS-232
	LAN
	AUX CONNECTOR
	DC INPUT INDICATOR
	BATTERY OPERATION INDICATOR
 DC 18V 2.5A	DC INPUT CONNECTOR

5. System Construction

Block Diagram



Digital Board



Power components

Power boards receives +5V, then creates 3.3V and 2.5V through the direct-direct rectifier.

CPU components

Samsung's S3C44B0X is installed operating at the 3.5 times speed of 18.432MHz, 64.512MHz. The CPU includes the STN LCD CONTROLLER; Real Time Clock is installed inside allowing the activation of the interior clock, if the crystal of 32.768KHz and power are supplied.

Memory components

Consists of the ROM 2MByte (Hynix HY29LV160BT) and RAM 8MByte (Samsung K4S641632); by moving program images of the ROM to RAM commands are run.

BACKUP Memory component

Consists of the 128KByte SRAM and theSRAM BACKUP CONTROLLER; Lion Batteryof 3V is required. Data needed even when the power is turned on is saved.

LCD components

Consists of the signal buffer, the DAC(Digital-Analog Conver), the Op Amp and the DC-DC Converter. DC-DC Converter converts +5V into +28V then supplies power to the Op Amp. The Op Amp multiplies the output of the DAC(0~2V) by 15 times. The output of the Op Amp equals to the LCD Bias Voltage. +3.3V signals from the CPU becomes +5V signals through the buffer, then is supplied to the LCD.

LAN Controller

Consists of Cirrus Logic's CS8900 Ethernet Controller and supports 10Base-T.

3V Lion

Back-up power for CPU's RTC and SRAM.

WATCH DOG TIMER

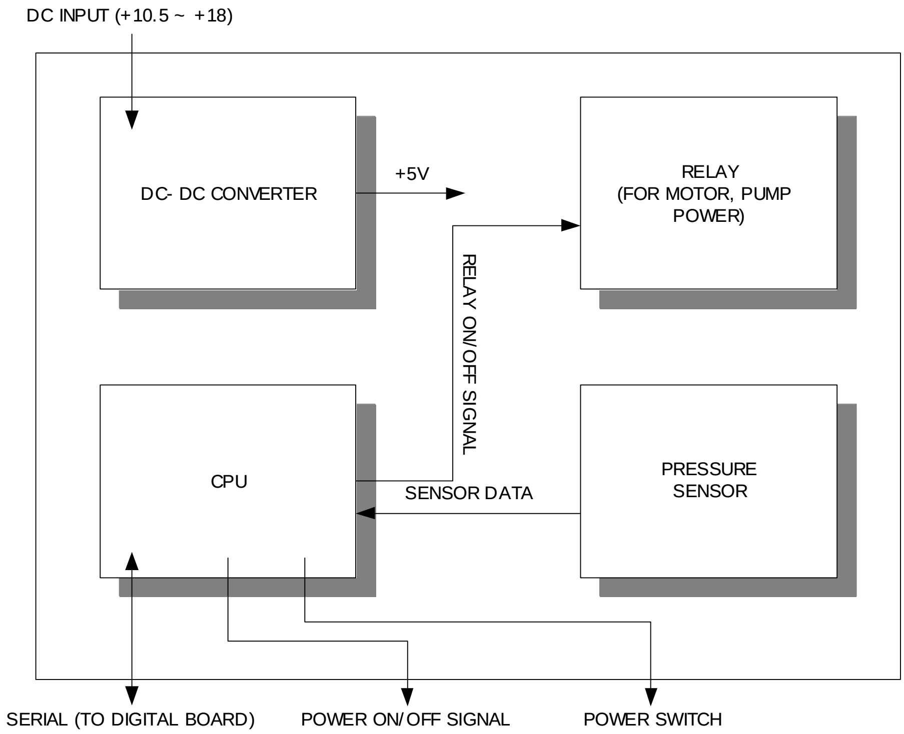
Resets the system should there be any failure in the system operation; saves system settings in the interior memory

Serial Controller

Communicates with the analog board through two serial channels.

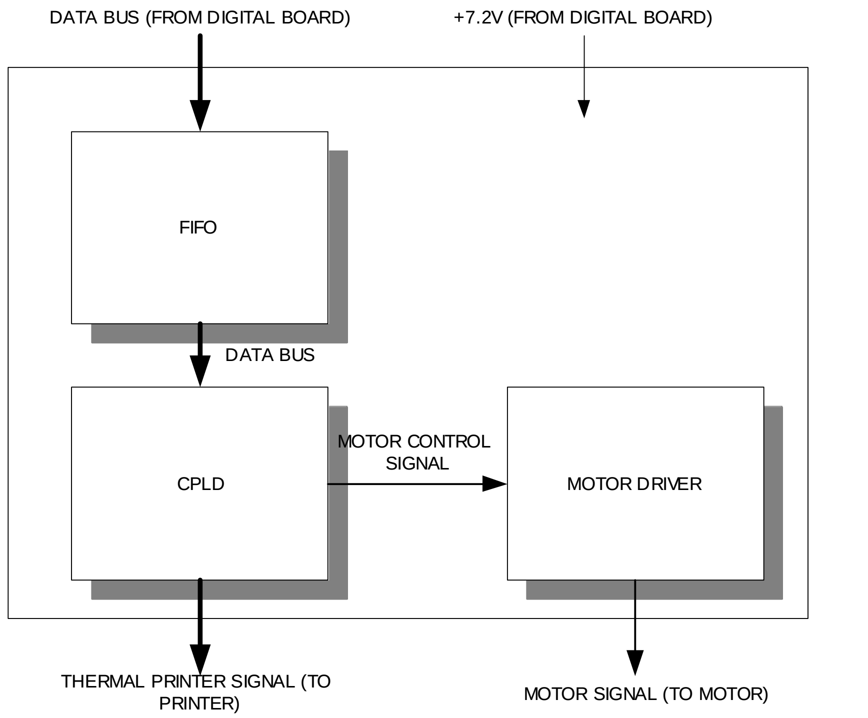
Safety Board

Cuts power off to the monitor and the pump in case of over pressure/over time to stablize NIBP; controls the overall power by receiving signals from power switch.



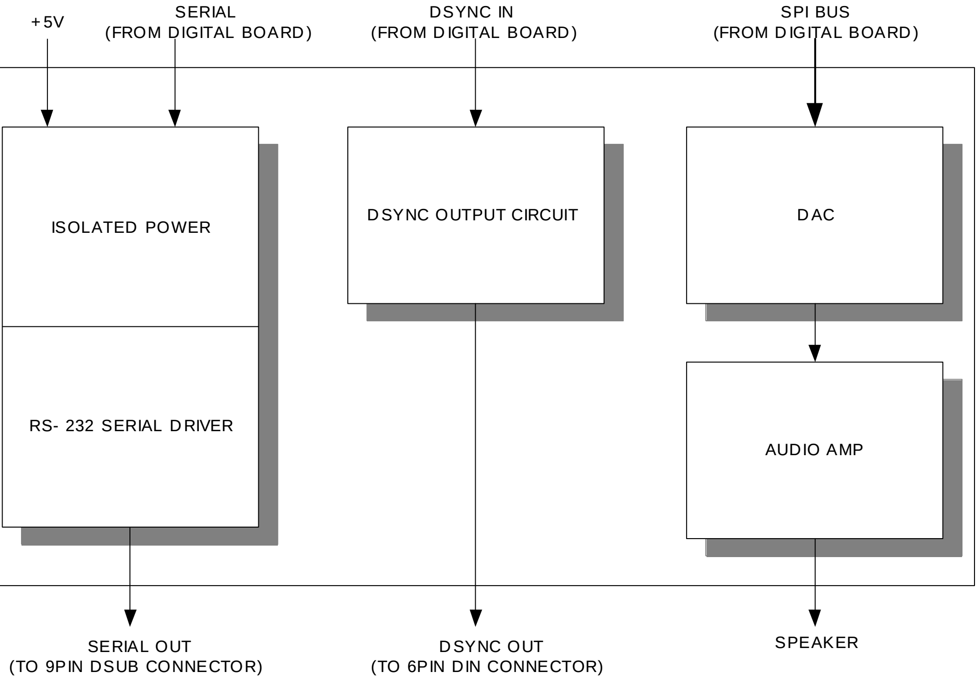
Printer Board

Connects to the Digital Board; generates the printer and the motor controlling signals using CPLD (Complete Program Logic Device)



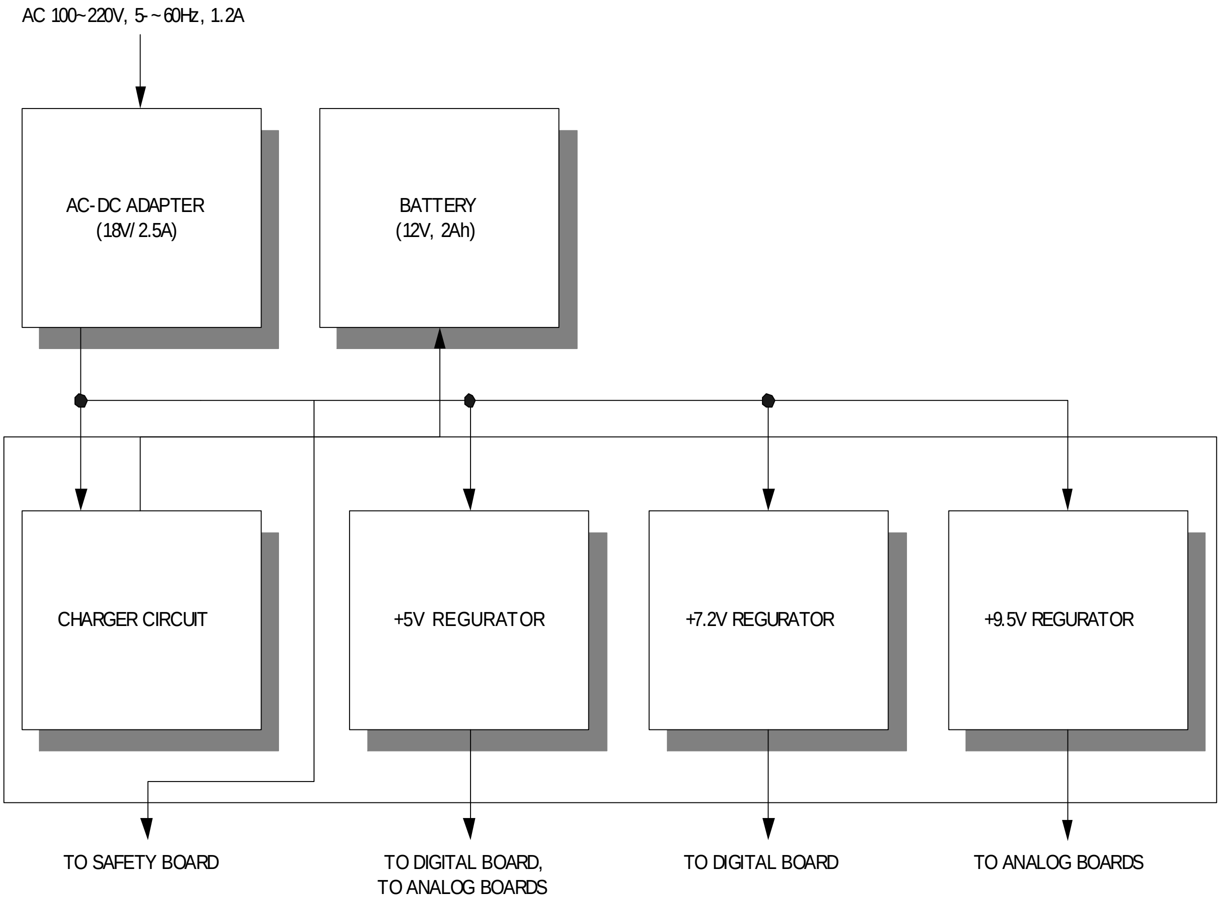
Ext. Board

Consists of the Speaker drive circuit, exterior serials and Dsync outputs



Power Board

Supplys power for each board while recharging.



Power Supply Fuse

An A.C Fuse of 250V/1.6A is built in the adapter. BM3's POWER Borad is protected by Fuse 5A/125V connected with a Battery protection Fuse 5A/125V which protects the product.

6. System Inspection

PRINTER

Inspection contents

- Pinter status
- No Paper
- Set the Speed
- Pinter noise

Inspection standards

- Detect the paper
- Normal operation in the speed 25mm/s, 50mm/s
- Noise when you use print
- Clear output

Inspection procedure

- Check the detection of the paper when the paper is in the device or not
- Check the speed of the printing after changing the printing speed
- Check the noise when print is working
- Check the status of the print-output

ECG

Inspection contents

- Lead Select
- Lead Fault
- Gain 1mV
- Pace Detect
- Noise

Inspection standards

- The alteration of the setting values of the lead(3 lead: I,II,III)
- Detect the each lead fault
- 10hz sine wave Amp : 10mm +/- 1mm
- Detect the pace maker signal
- 1mm

Inspection procedure

- Check the alteration after connecting the 5 leads ecg cable to simulator
- Check the lead fault in the each lead
- Check the gain of the printer-output after setting the 10hz sine wave in the simulator
- Check the letter P in the display after setting the pace mode in the simulator
- Check the size of the base noise after connecting the human body

RESPERATION

Inspection contents

- Gain 1Ω

- Noise

Inspection standards

- The wave size in the LCD display and printer should be within 10mm +/- 1 mm.
- The wave size of the noise in the LCD display and printer should be within 2 mm.

Inspection procedure

- Check the gain of the printer-out by using the simulator ; 1Ω

- Check the noise by using the simulator ; 0Ω, display x10

SpO2

Inspection contents

- Precision
- No finger
- Lead Fault

Inspection standards

- Amp. 0.3 , %spo2 96: +/- 2
- Detect the NO FINGER
- Detect the lead fault

Inspection procedure

- Check the error by using the simulator ; Amp 0.3, % 96
- Check the message when you don't put the finger in the Probe
- Check the message when the spo2 connector is disconnected from the main device

TEMP

Inspection contents

- Precision
- Lead Fault

Inspection standards

- The temp. 20, 37°C : +/- 0.1°C
- Detect the lead fault

Inspection procedure

- Check the error after setting temp. by using the precision -resistance box

- Check the message when the temp connector is disconnected from the main device

NIBP

Inspection contents

- Precision
- Set the Zero
- Operate the OVP
- Auto measurement

Inspection standards

- The mean values after measuring 5 times : +/- 5mmHg
- Set the normal zero
- adult : 290mmHg
- Auto measurement in the auto-mode

Inspection procedure

- Check the values 5 times in the arm cuff mode by using the simulator ; 120/93/80, 200/196/180
- Set the zero in the device
- Check the OVP operation by using the simulator ; 290mmHg
- Check the operation in the interval 1 minute

ALARM

Inspection contents

- Control the volume of the sound
- Operate the alarm

Inspection standards

- Control the volume of the sound
- The alarm mode according the setting values & situation

Inspection procedure

- Check the volume level of the sound
- Check the alarm sound after changing the ECG HR

Electrical safety

Inspection contents

- Inspect the voltage
- Inspect the patient leakage current

Inspection standards

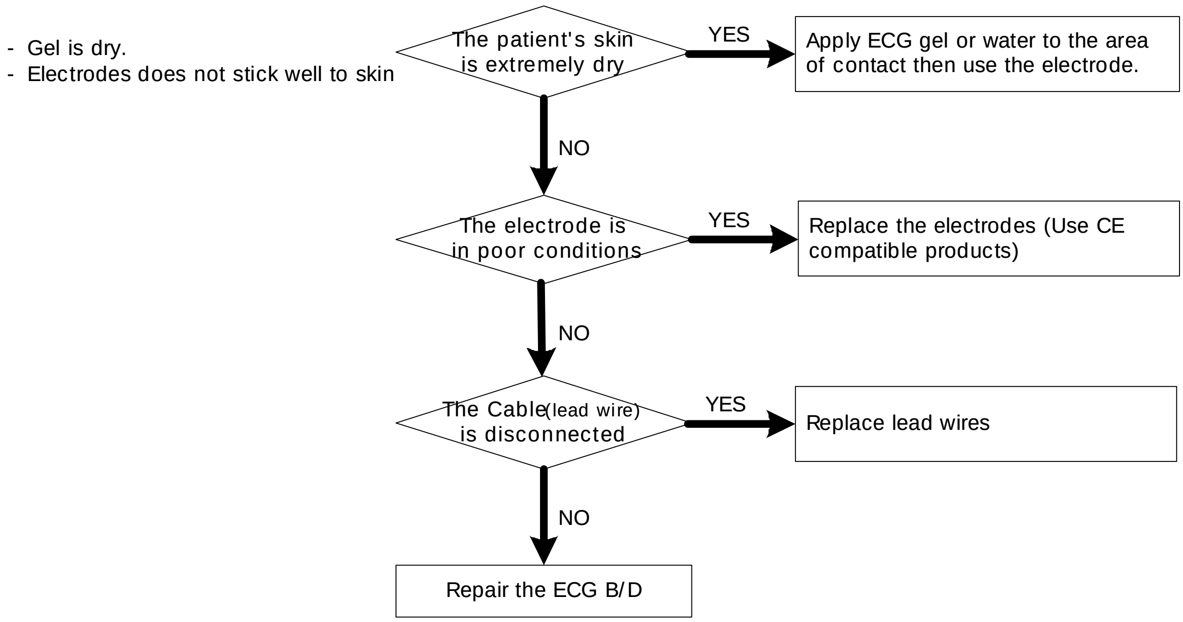
- Between the power teminals :1500Volt
- Between the power and ECG electrode : AC4000Volt
- Between the power and temp : AC4000Volt
- Patient leakage current should be under 50uA

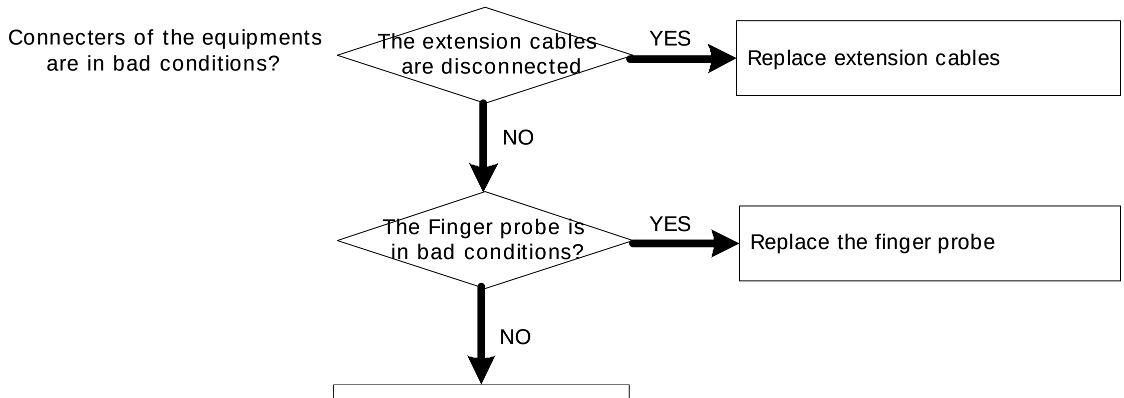
Inspection procedure

- Check the insulation after giving the AC1500Volt during 60 sec. between power teminals
- Check the insulation after giving the AC4000Volt during 60 sec. between power teminals and terminals of the ECG electrode
- Check the insulation after giving the AC4000Volt during 60 sec. between power teminals and the temp sensor
- Check the leakage current after connecting the all sensor

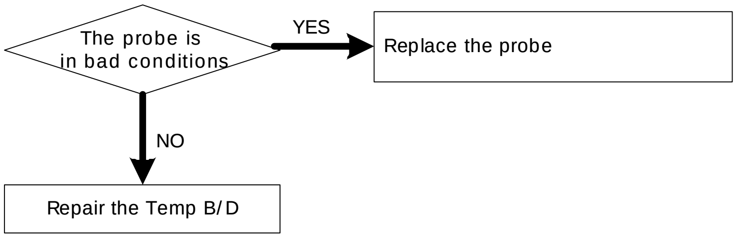
7. Trouble Shoot

1. Noise in ECG

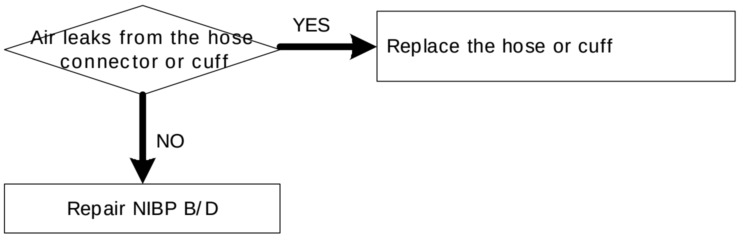




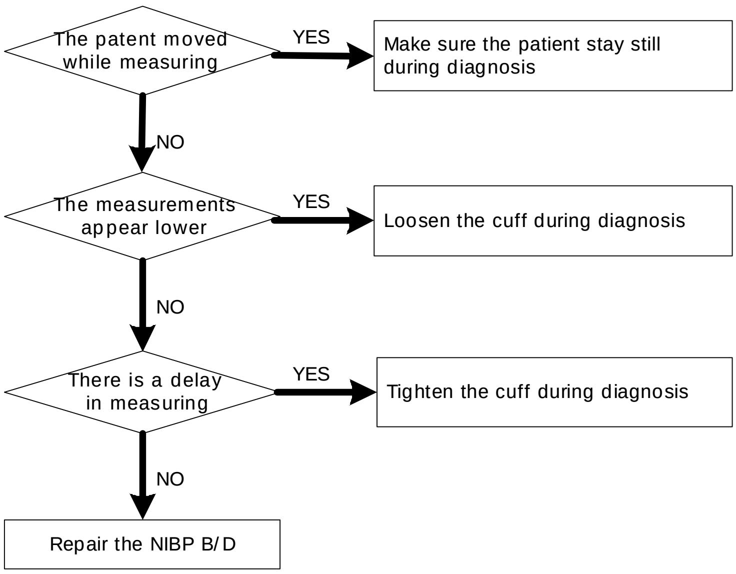
3.Temp malfunction



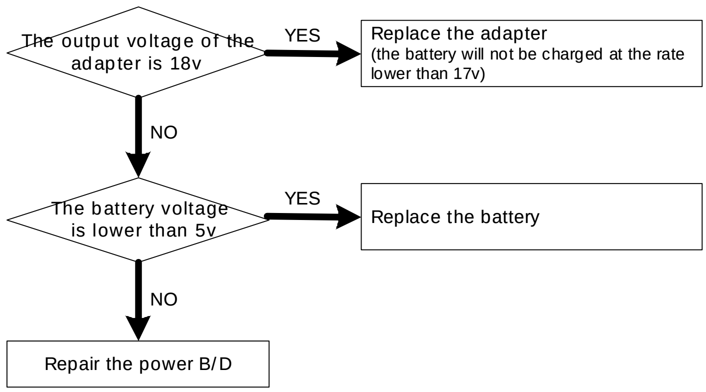
4. NIBP malfuction



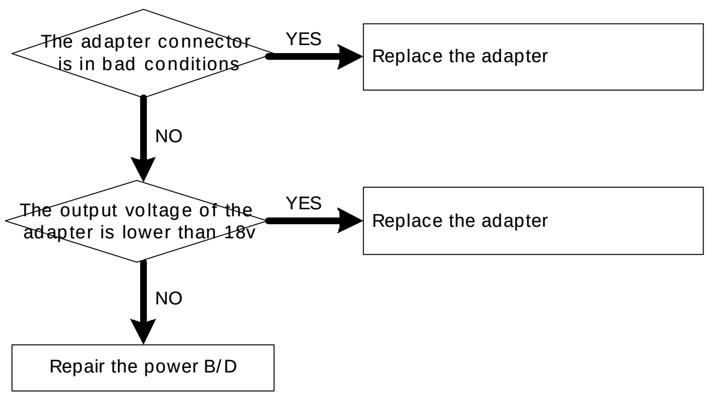
5. Abnormality in NIBP measurements

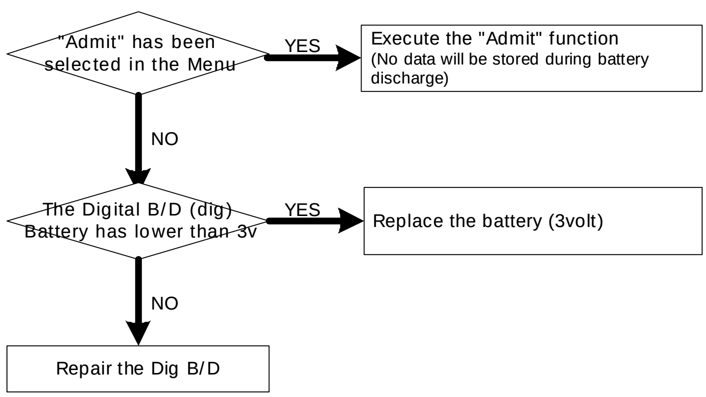


6. Failure in battery recharge (the battery does not fully recharge in 6 hours or more)

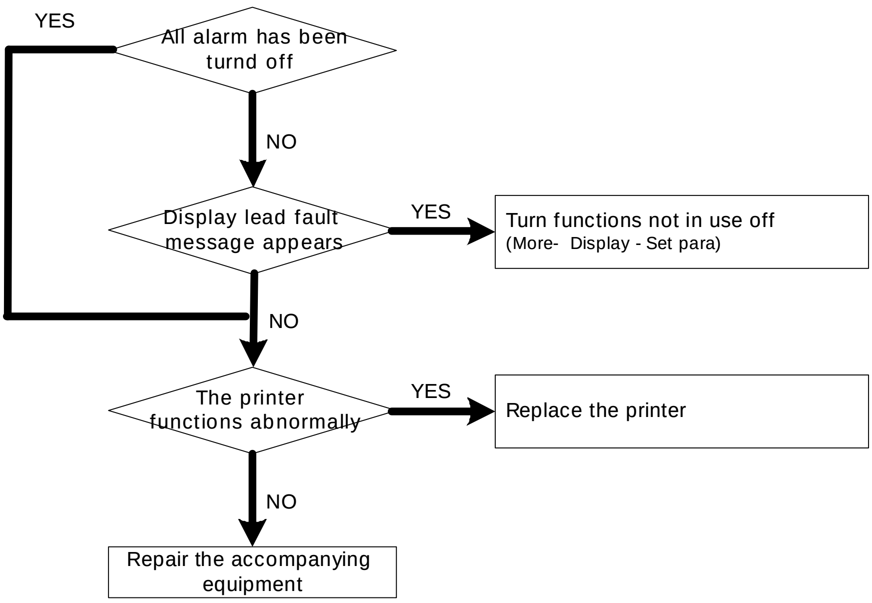


7. Power failure

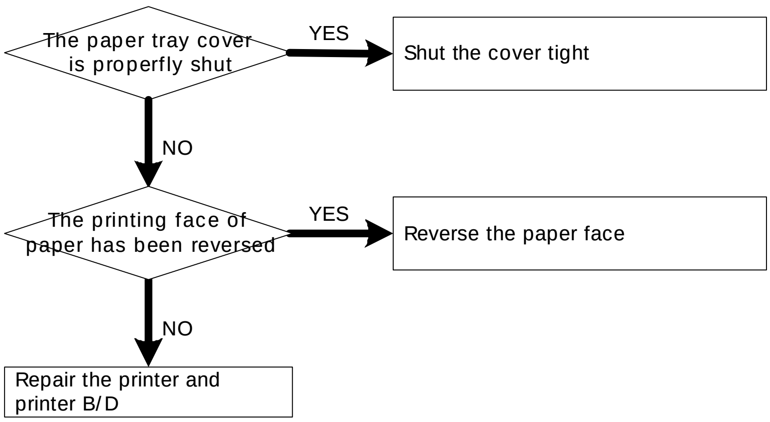




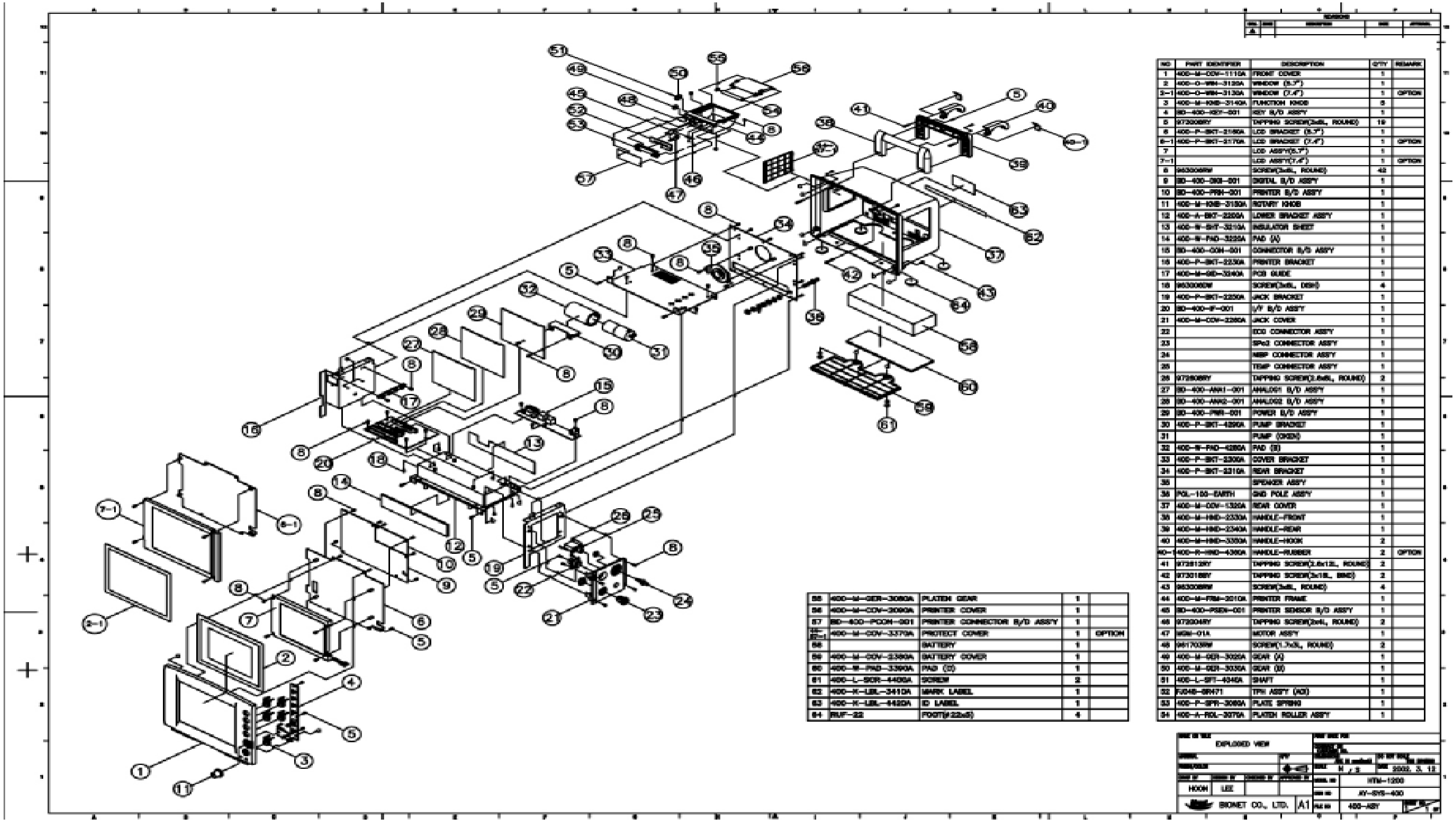
9. Periodic noises



10. Print failure



8. Exploded View

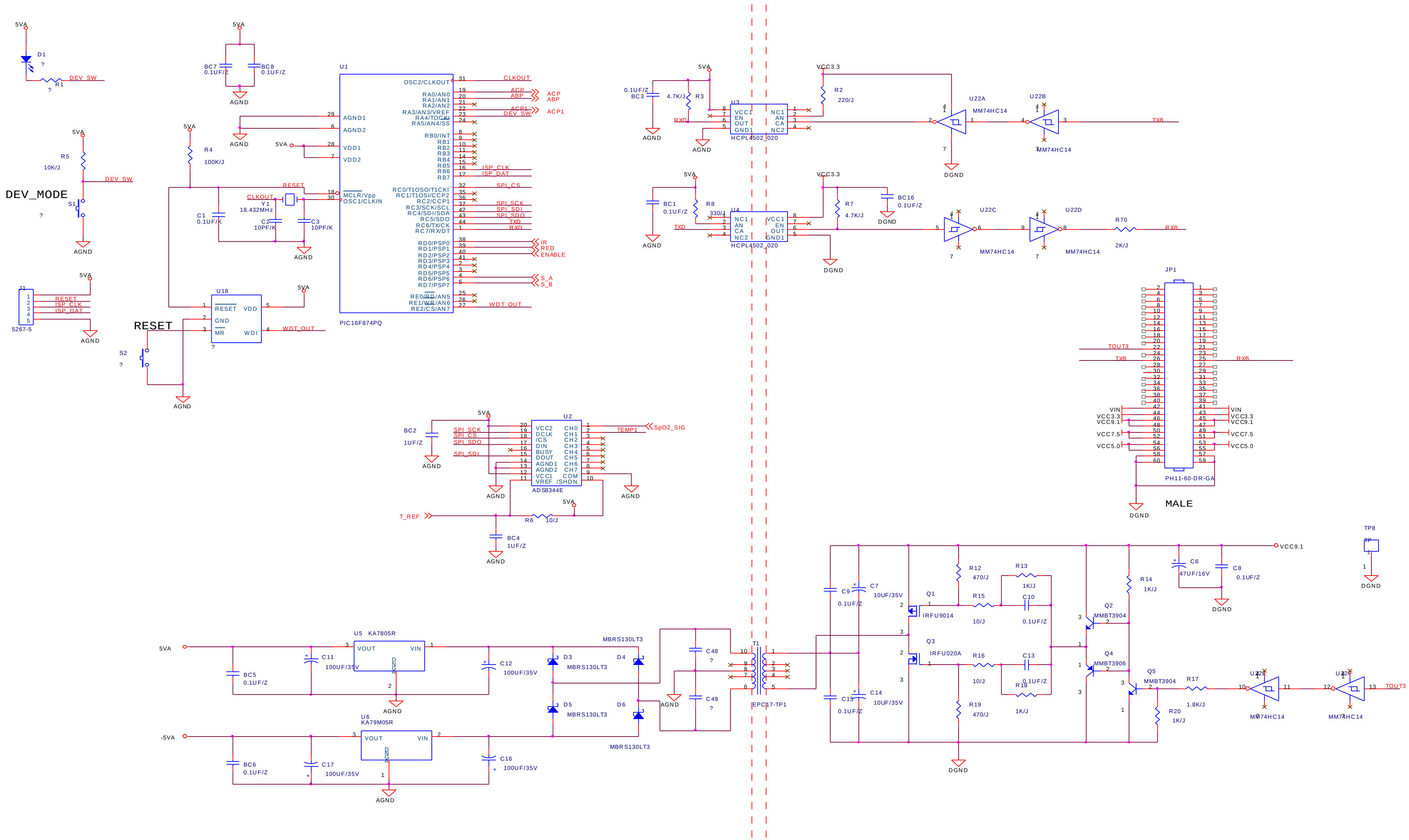


NO	PART IDENTIFIER	DESCRIPTION	Q'TY	REMARK
1	400-M-COV-1110A	FRONT COVER	1	
2	400-O-WIN-3120A	WINDOW (5.7")	1	
2-1	400-O-WIN-3130A	WINDOW (7.4")	1	OPTION
3	400-M-KNB-3140A	FUNCTION KNOB	5	
4	BD-400-KEY-001	KEY B/D ASS'Y	1	
5	972308RY	TAPPING SCREW(3x8L, ROUND)	19	
6	400-P-BKT-2160A	LCD BRACKET (5.7")	1	
6-1	400-P-BKT-2170A	LCD BRACKET (7.4")	1	OPTION
7		LCD ASS'Y(5.7")	1	
7-1		LCD ASS'Y(7.4")	1	OPTION
8	963306RW	SCREW(3x6L, ROUND)	42	
9	BD-400-DIG-001	DIGITAL B/D ASS'Y	1	
10	BD-400-PRN-001	PRINTER B/D ASS'Y	1	
11	400-M-KNB-3150A	ROTARY KNOB	1	
12	400-A-BKT-2200A	LOWER BRACKET ASS'Y	1	
13	400-W-SHT-3210A	INSULATOR SHEET	1	
14	400-W-PAD-3220A	PAD (A)	1	
15	BD-400-CON-001	CONNECTOR B/D ASS'Y	1	
16	400-P-BKT-2230A	PRINTER BRACKET	1	
17	400-M-GID-3240A	PCB GUIDE	1	
18	963306DW	SCREW(3x6L, DISH)	4	
19	400-P-BKT-2250A	JACK BRACKET	1	
20	BD-400-IF-001	I/F B/D ASS'Y	1	
21	400-M-COV-2260A	JACK COVER	1	
22		ECG CONNECTOR ASS'Y	1	
23		SPo2 CONNECTOR ASS'Y	1	
24		NIBP CONNECTOR ASS'Y	1	
25		TEMP CONNECTOR ASS'Y	1	
26	97260BRY	TAPPING SCREW(2.6x8L, ROUND)	2	
27	BD-400-ANA1-001	ANALOG1 B/D ASS'Y	1	
28	BD-400-ANA2-001	ANALOG2 B/D ASS'Y	1	
29	BD-400-PWR-001	POWER B/D ASS'Y	1	
30	400-P-BKT-4290A	PUMP BRACKET	1	
31		PUMP (OKEN)	1	
32	400-W-PAD-4280A	PAD (B)	1	
33	400-P-BKT-2300A	COVER BRACKET	1	
34	400-P-BKT-2310A	REAR BRACKET	1	
35		SPEAKER ASS'Y	1	
36	POL-100-EARTH	GND POLE ASS'Y	1	
37	400-M-COV-1320A	REAR COVER	1	
38	400-M-HND-2330A	HANDLE-FRONT	1	
39	400-M-HND-2340A	HANDLE-REAR	1	
40	400-M-HND-3350A	HANDLE-HOOK	2	
40-1	400-R-HND-4360A	HANDLE-RUBBER	2	OPTION
41	972612RY	TAPPING SCREW(2.6x12L, ROUND)	2	
42	97301BBY	TAPPING SCREW(3x18L, BIND)	2	
43	96330BRW	SCREW(3x8L, ROUND)	4	
44	400-M-FRM-2010A	PRINTER FRAME	1	
45	BD-400-PSEN-001	PRINTER SENSOR B/D ASS'Y	1	
46	972004RY	TAPPING SCREW(2x4L, ROUND)	2	
47	WGN-01A	MOTOR ASS'Y	1	
48	961703RW	SCREW(1.7x3L, ROUND)	2	
49	400-M-GER-3020A	GEAR (A)	1	
50	400-M-GER-3030A	GEAR (B)	1	
51	400-L-SFT-4040A	SHAFT	1	
52	FJ048-BR471	TPH ASS'Y (KO)	1	
53	400-P-SPR-3060A	PLATE SPRING	1	
54	400-A-ROL-3070A	PLATEN ROLLER ASS'Y	1	

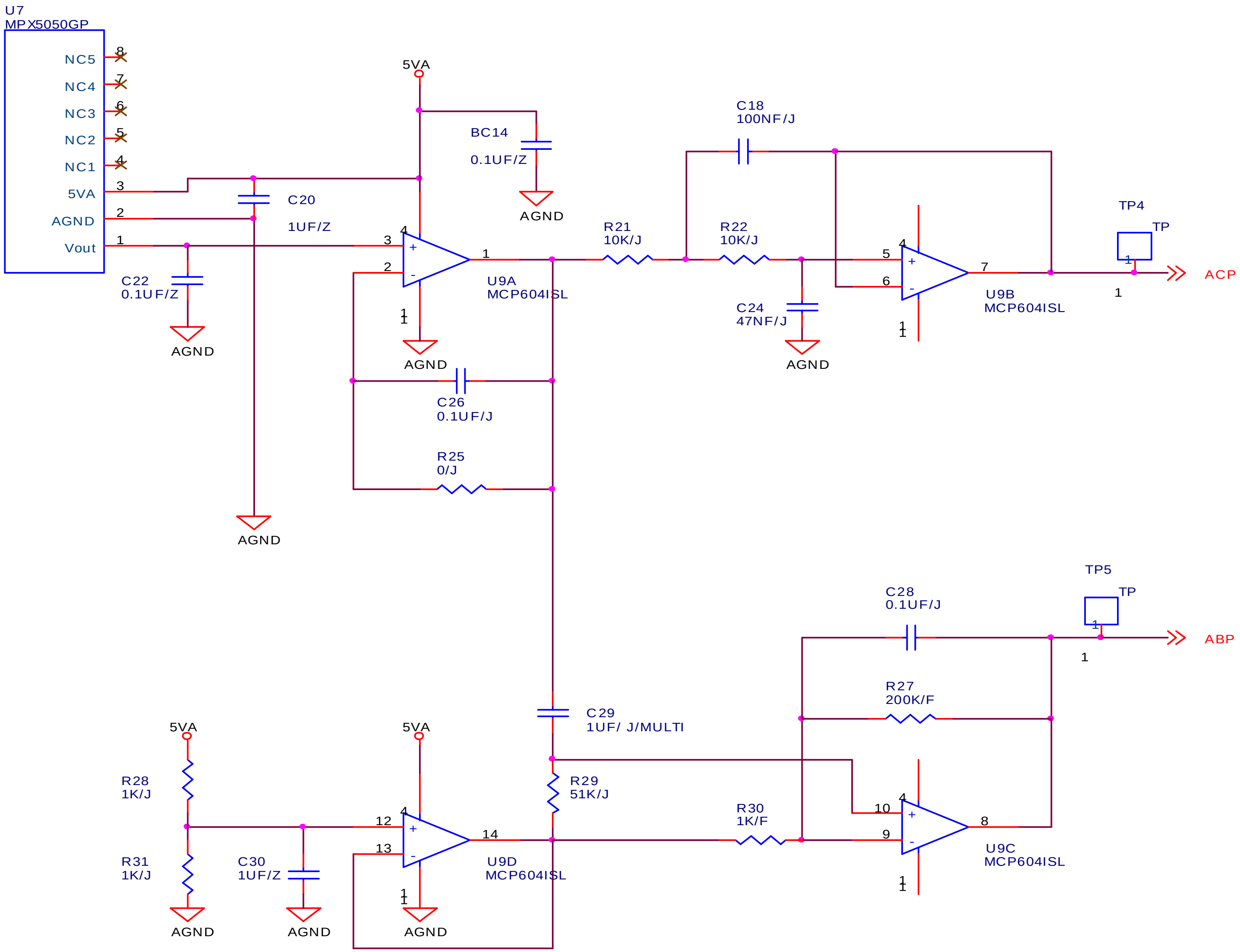
55	400-M-GER-3080A	PLATEN GEAR	1	
56	400-M-COV-3090A	PRINTER COVER	1	
57	BD-400-PCON-001	PRINTER CONNECTOR B/D ASS'Y	1	
57-1	400-M-COV-3370A	PROTECT COVER	1	OPTION
58		BATTERY	1	
59	400-M-COV-2380A	BATTERY COVER	1	
60	400-W-PAD-3390A	PAD (C)	1	
61	400-L-SCR-4400A	SCREW	2	
62	400-K-LBL-3410A	MARK LABEL	1	
63	400-K-LBL-4420A	ID LABEL	1	
64	RUF-22	FOOT(Ø22x5)	4	

9. Circuit Diagram

Analog1 b/d, digital part

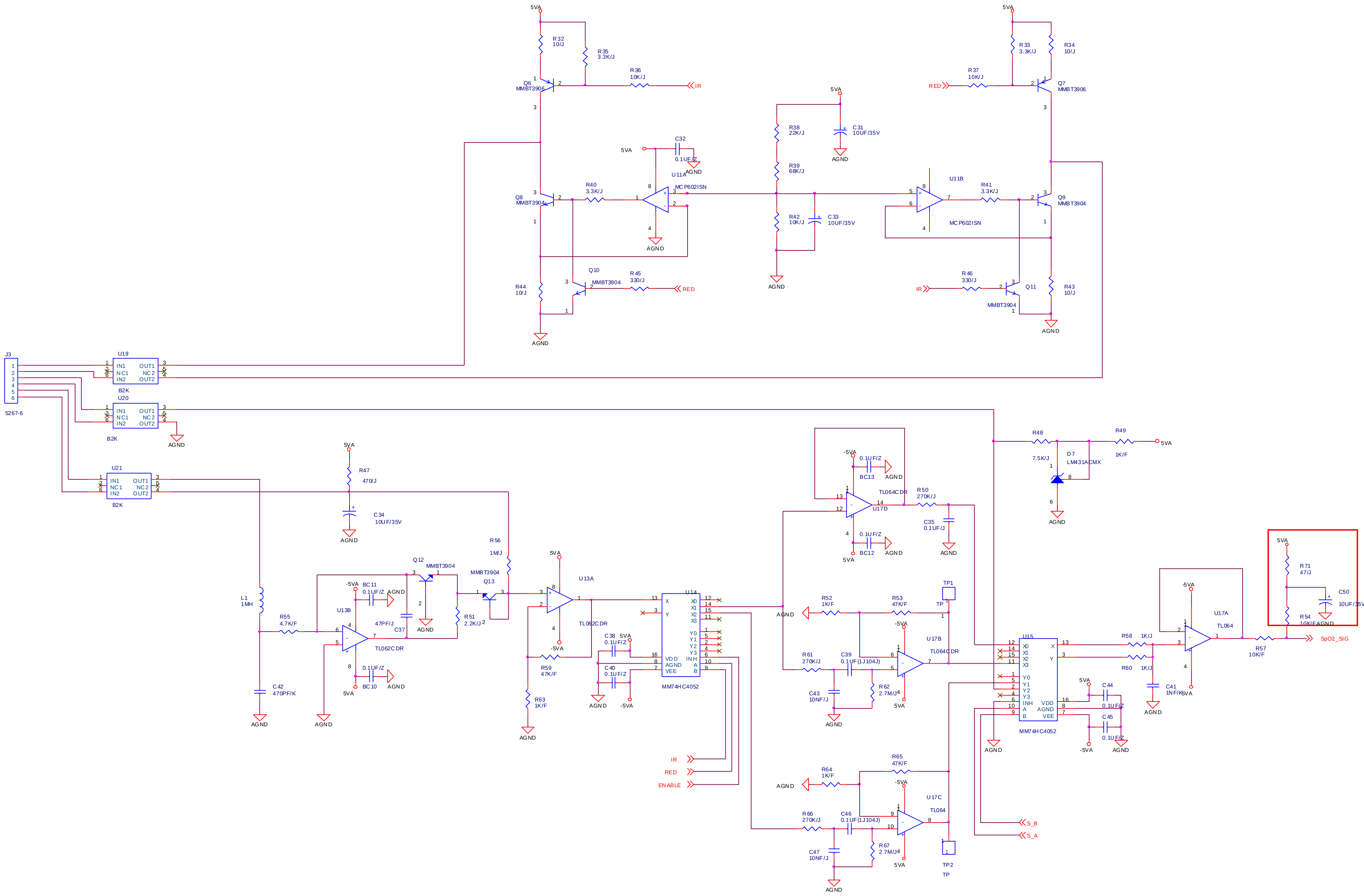


Analog1 b/d, Nibp part

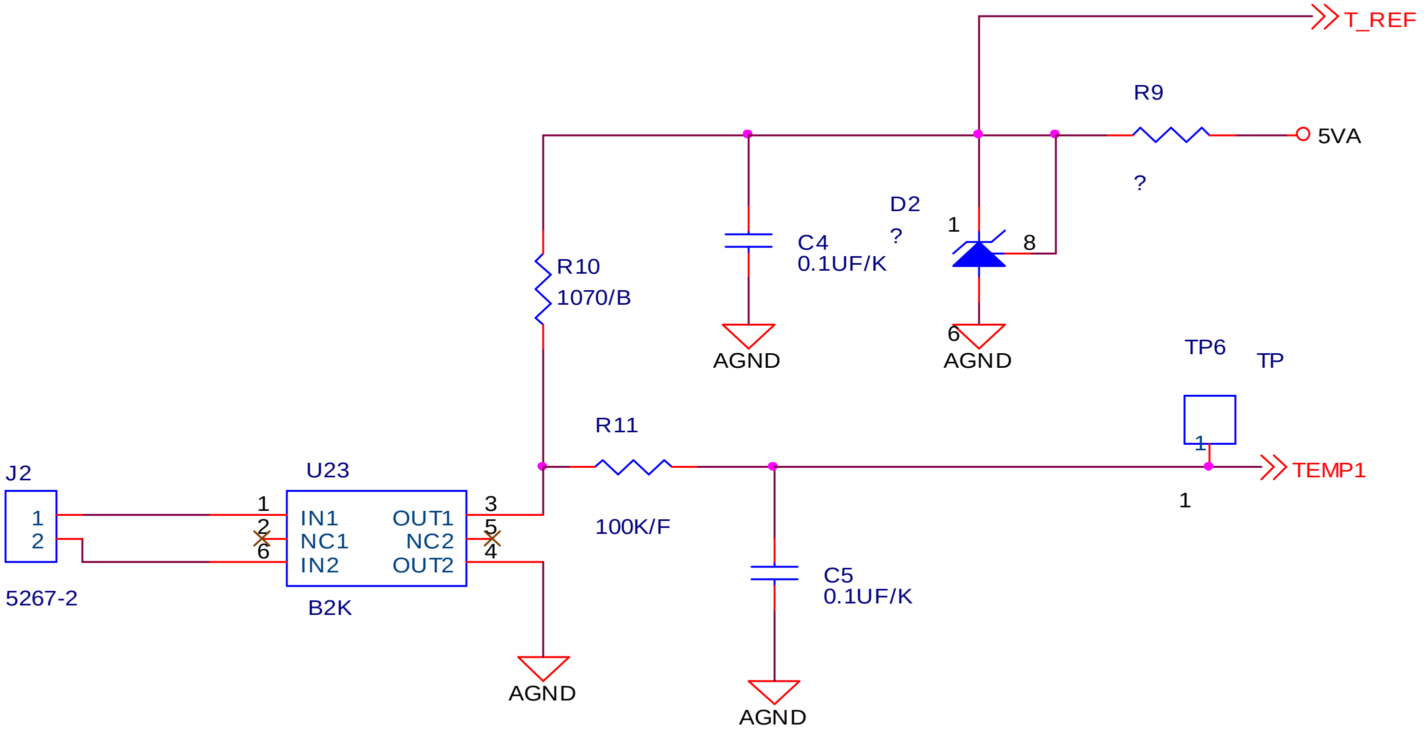


Revision A

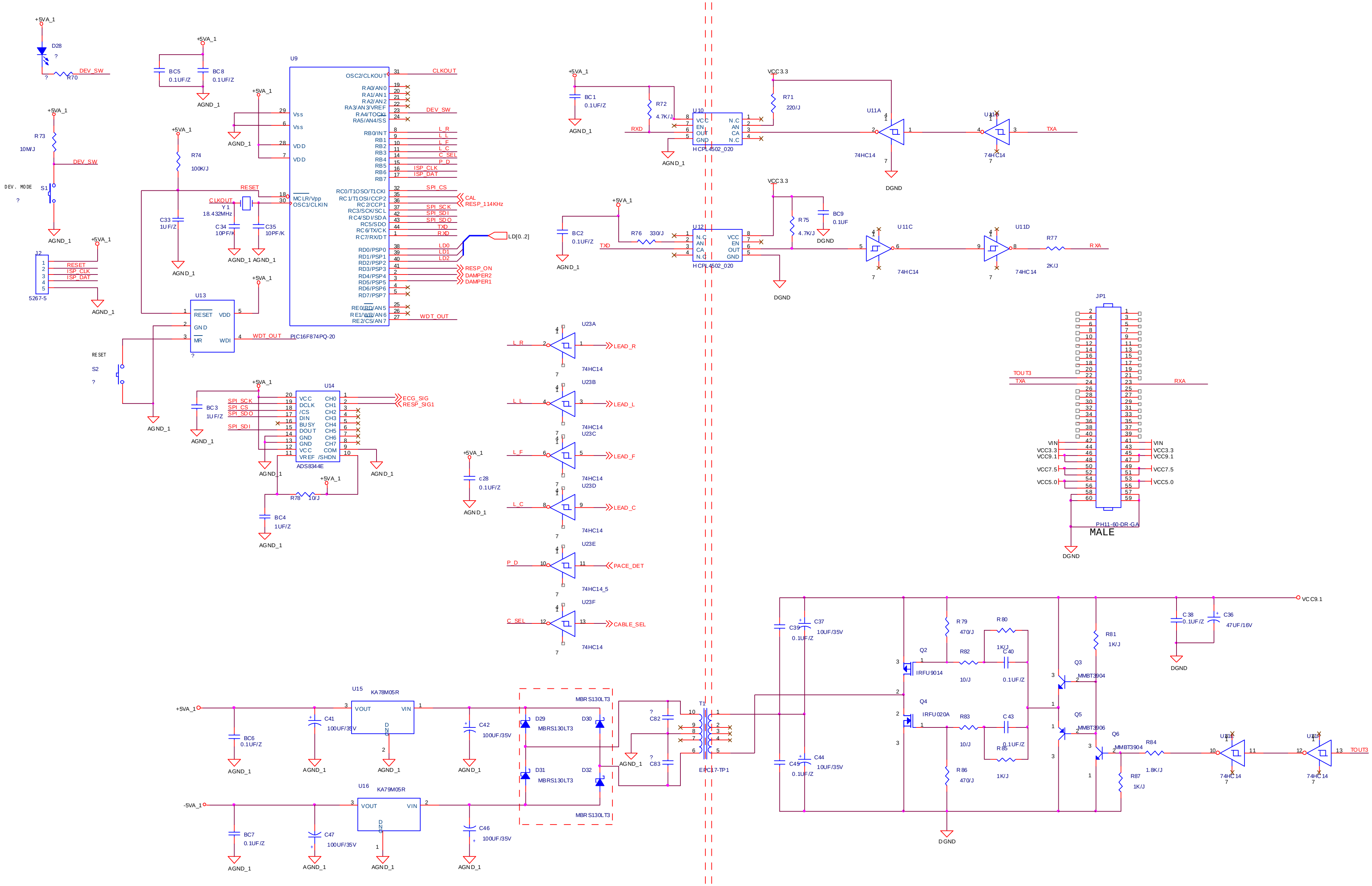
Analog1 b/d, SpO2 part



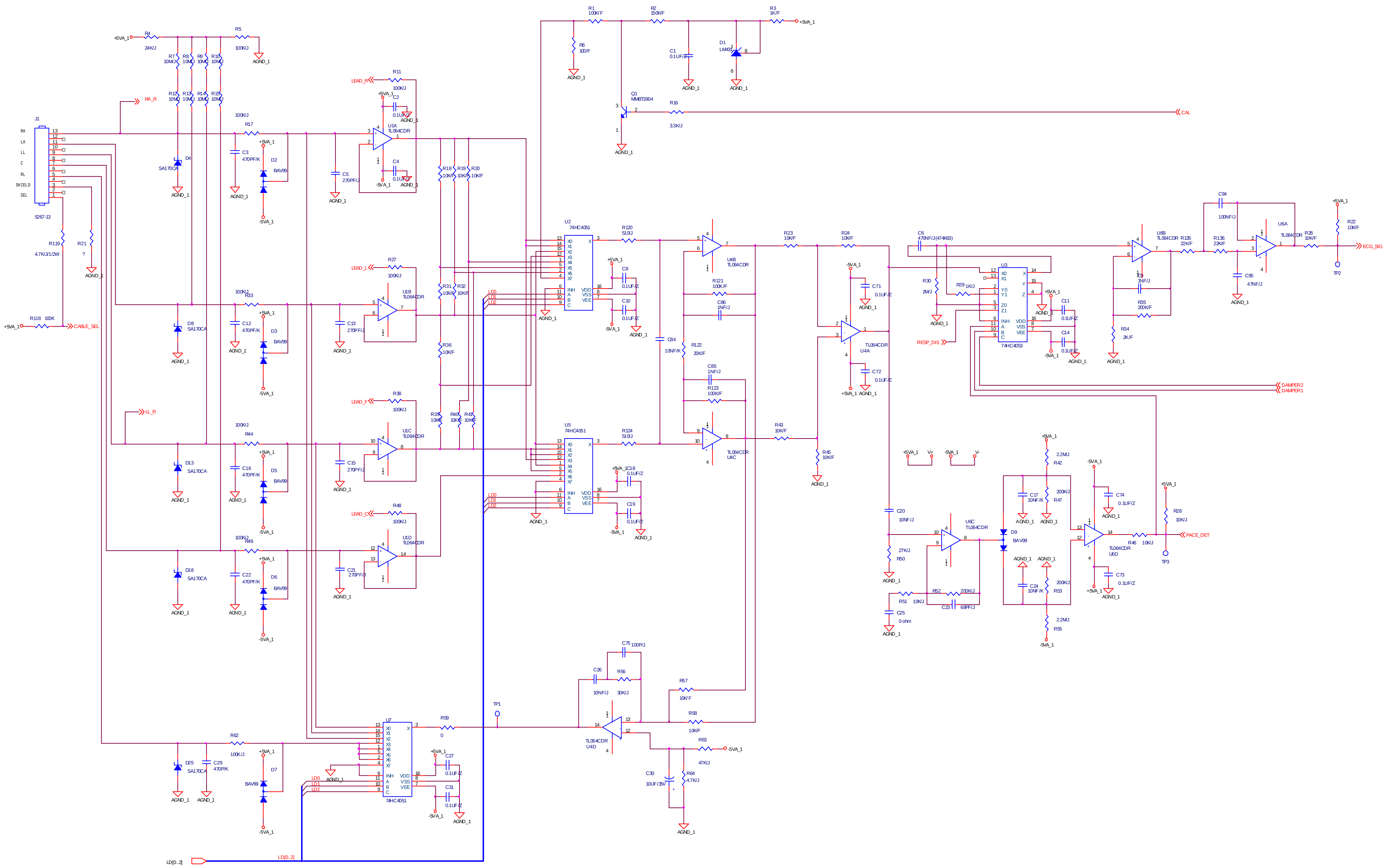
Analog1 b/d, Temp part



Analog2 b/d, Digital part

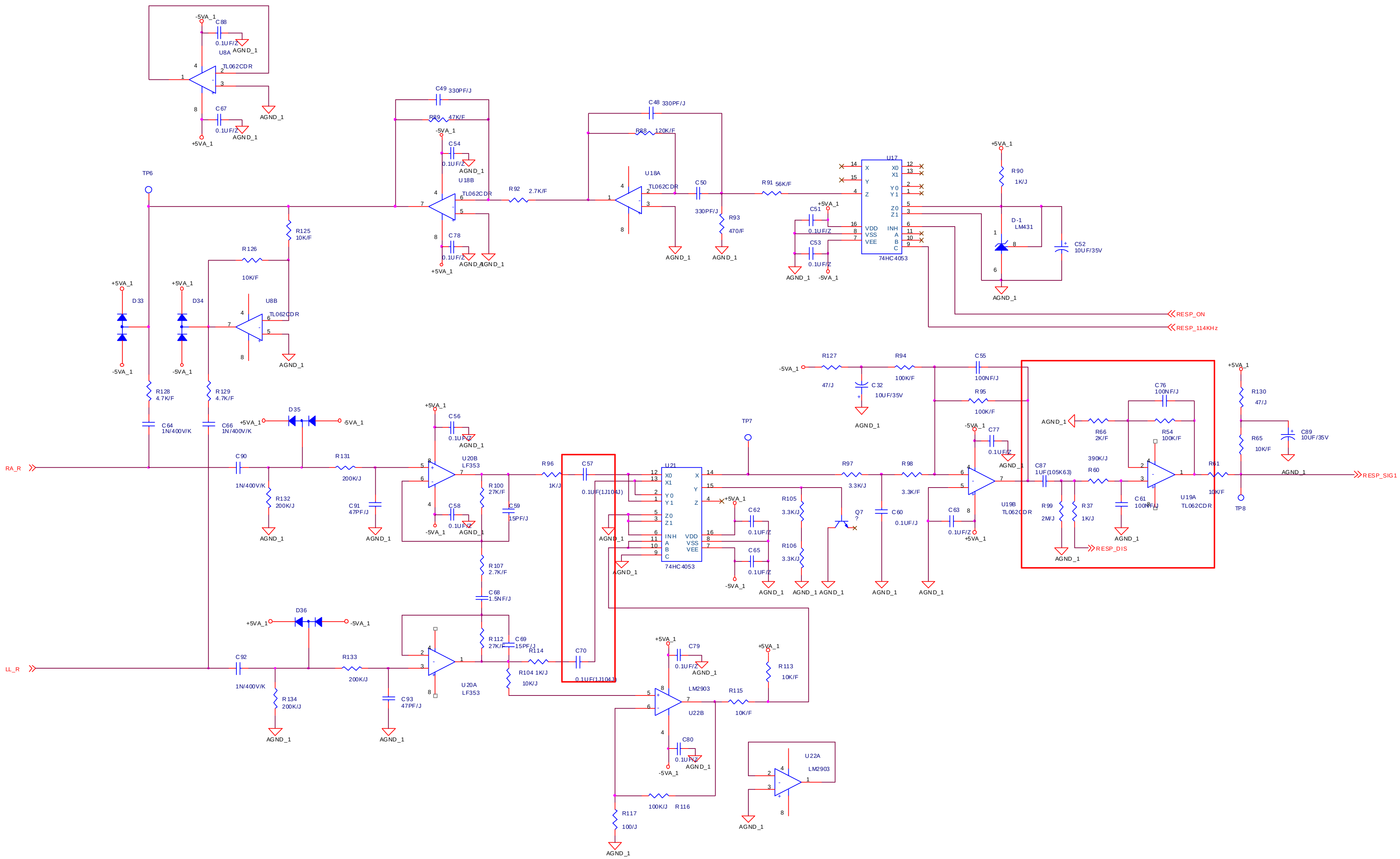


Analog2 b/d, ECG part

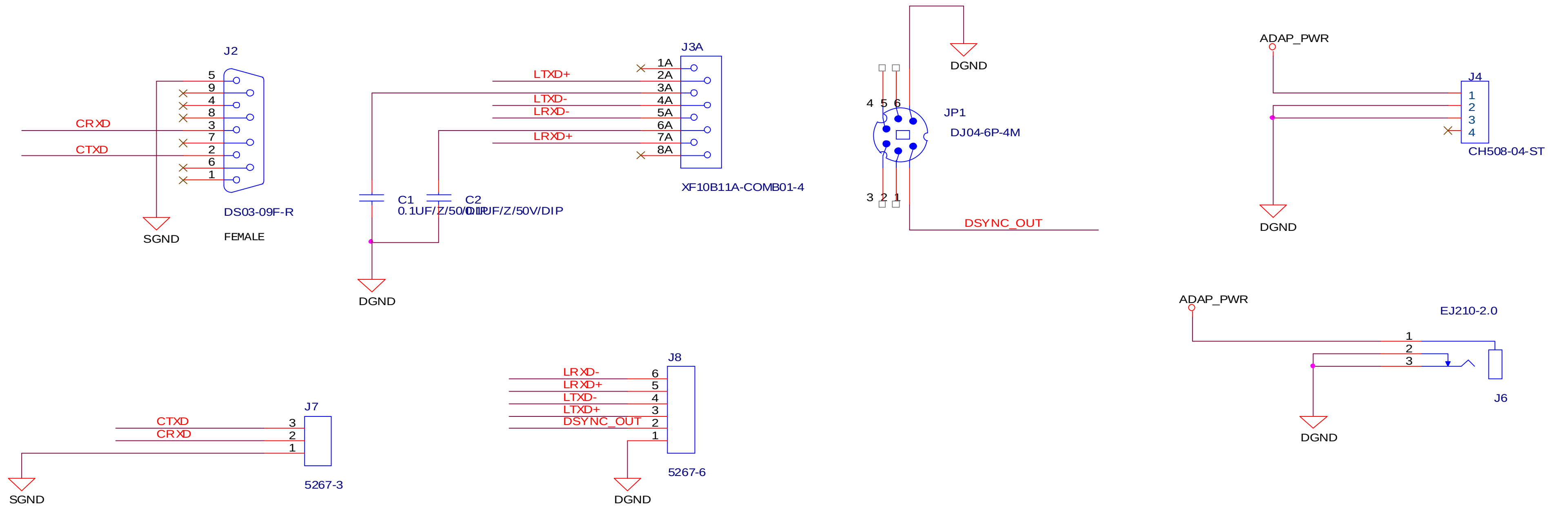


Revision A

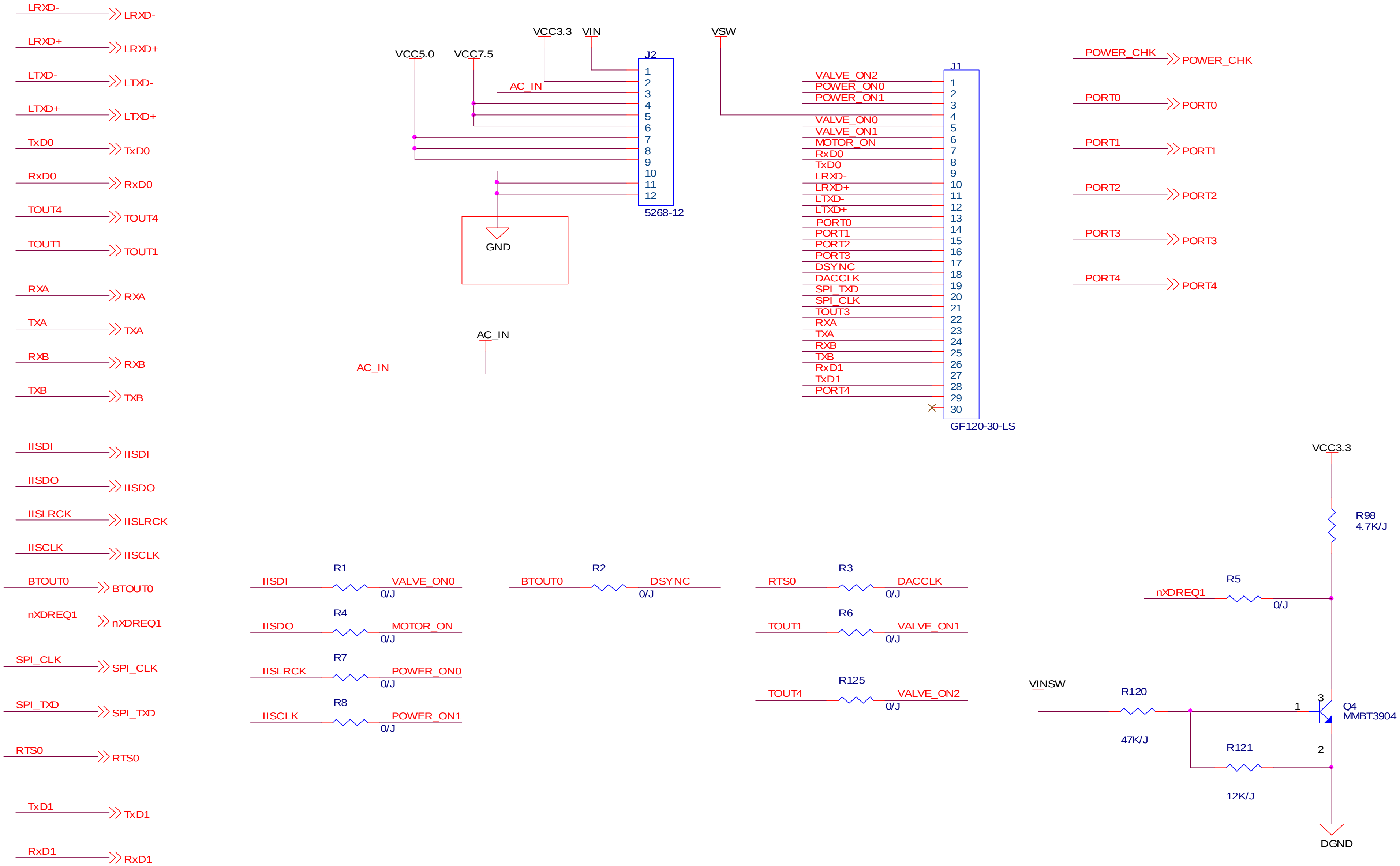
Analog2 b/d, respiraton part



Connector b/d

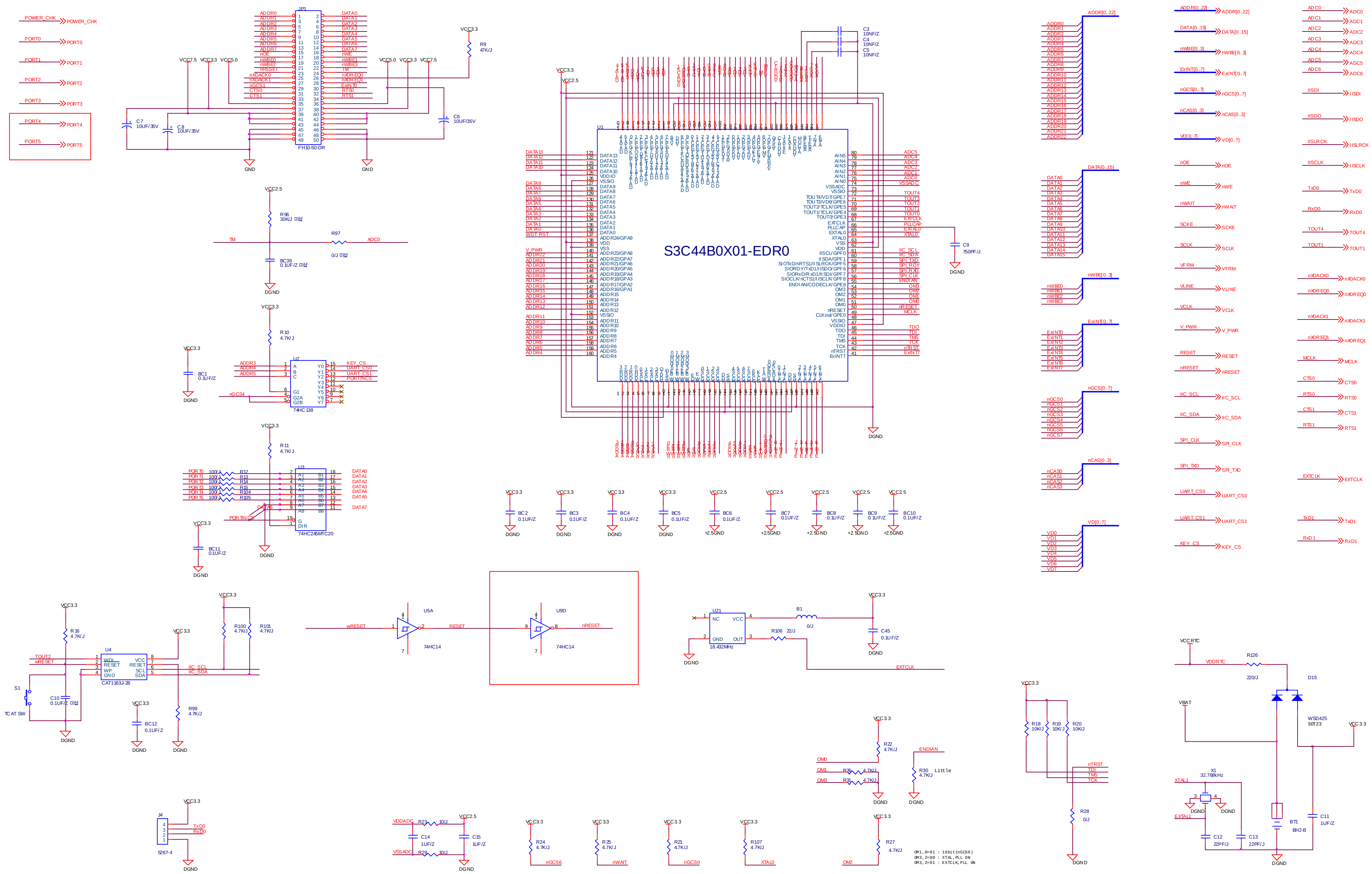


Digital b/d, I/F connector part



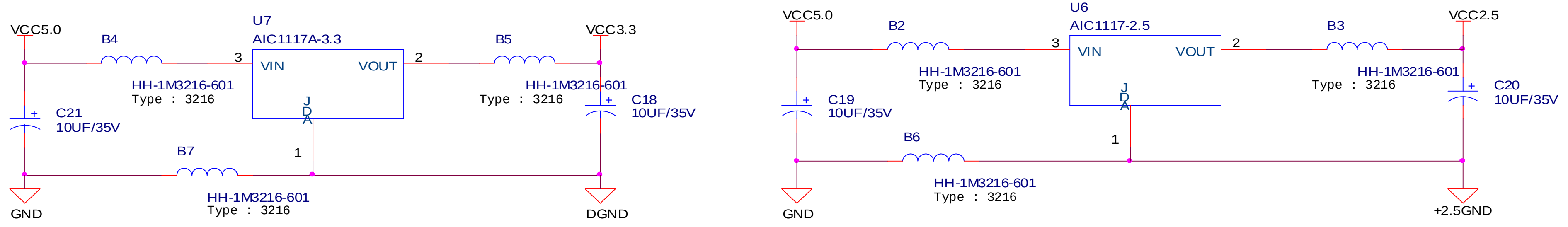
Revision A

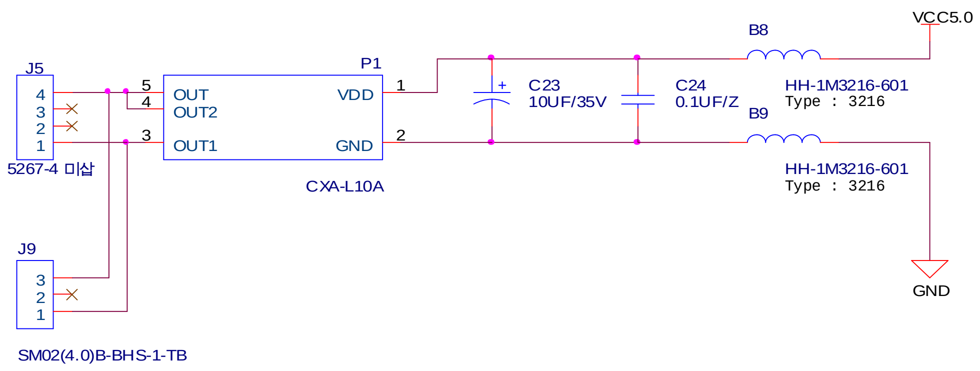
Dgital b/d, CPU part



Revision A

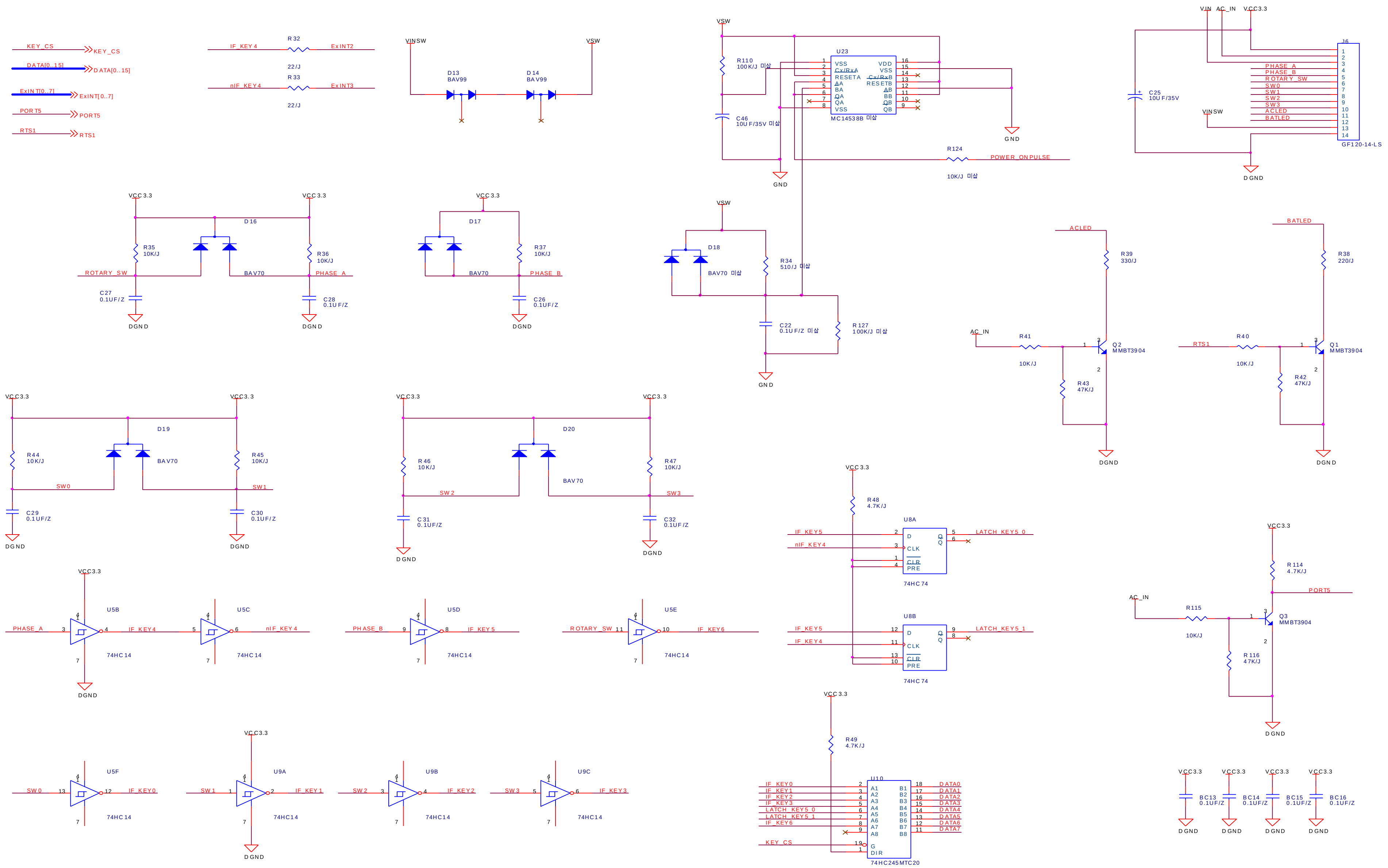
Digital b/d, DC/DC converter part





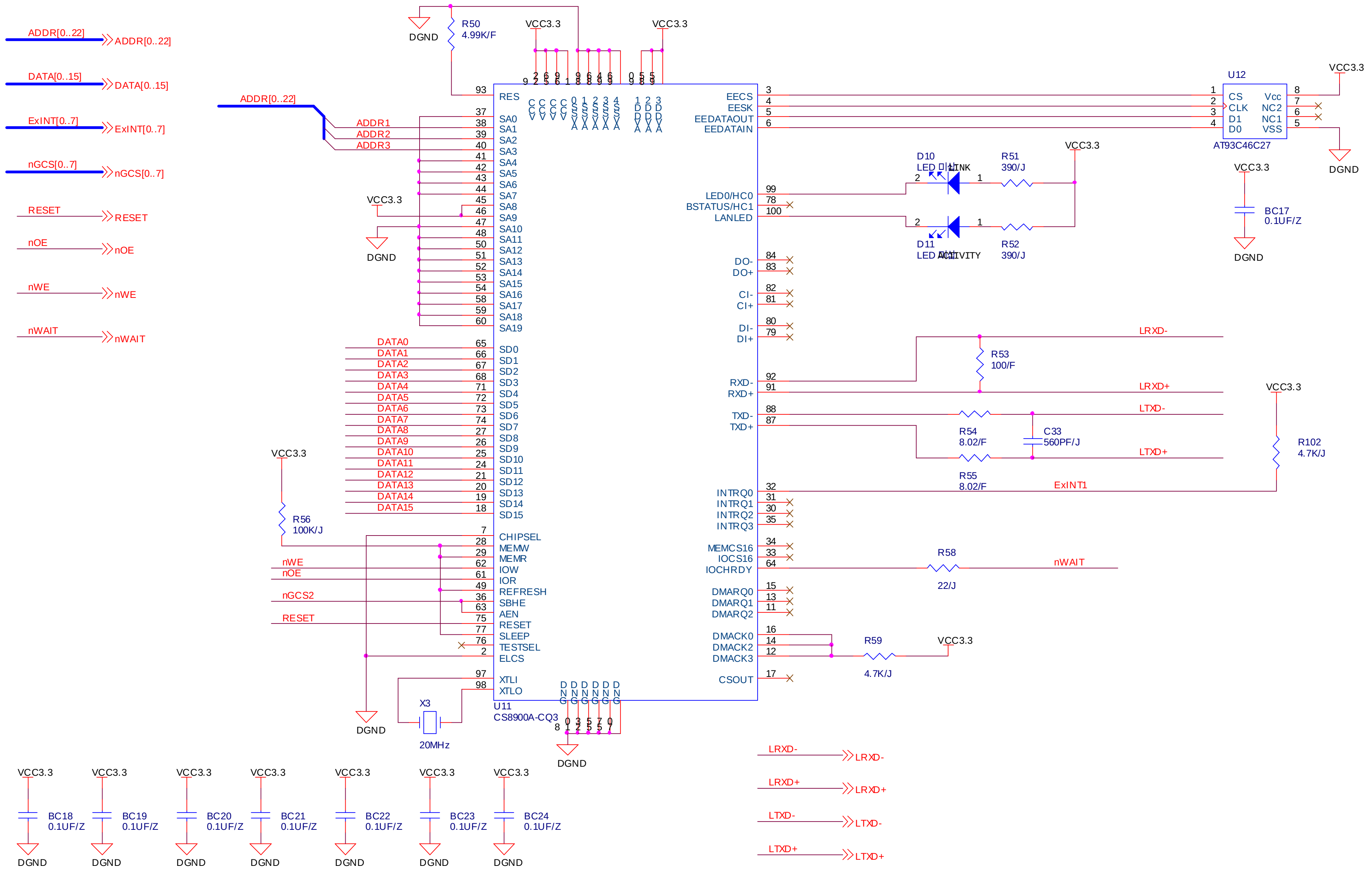
Revision A

Digital b/d, key b/d part



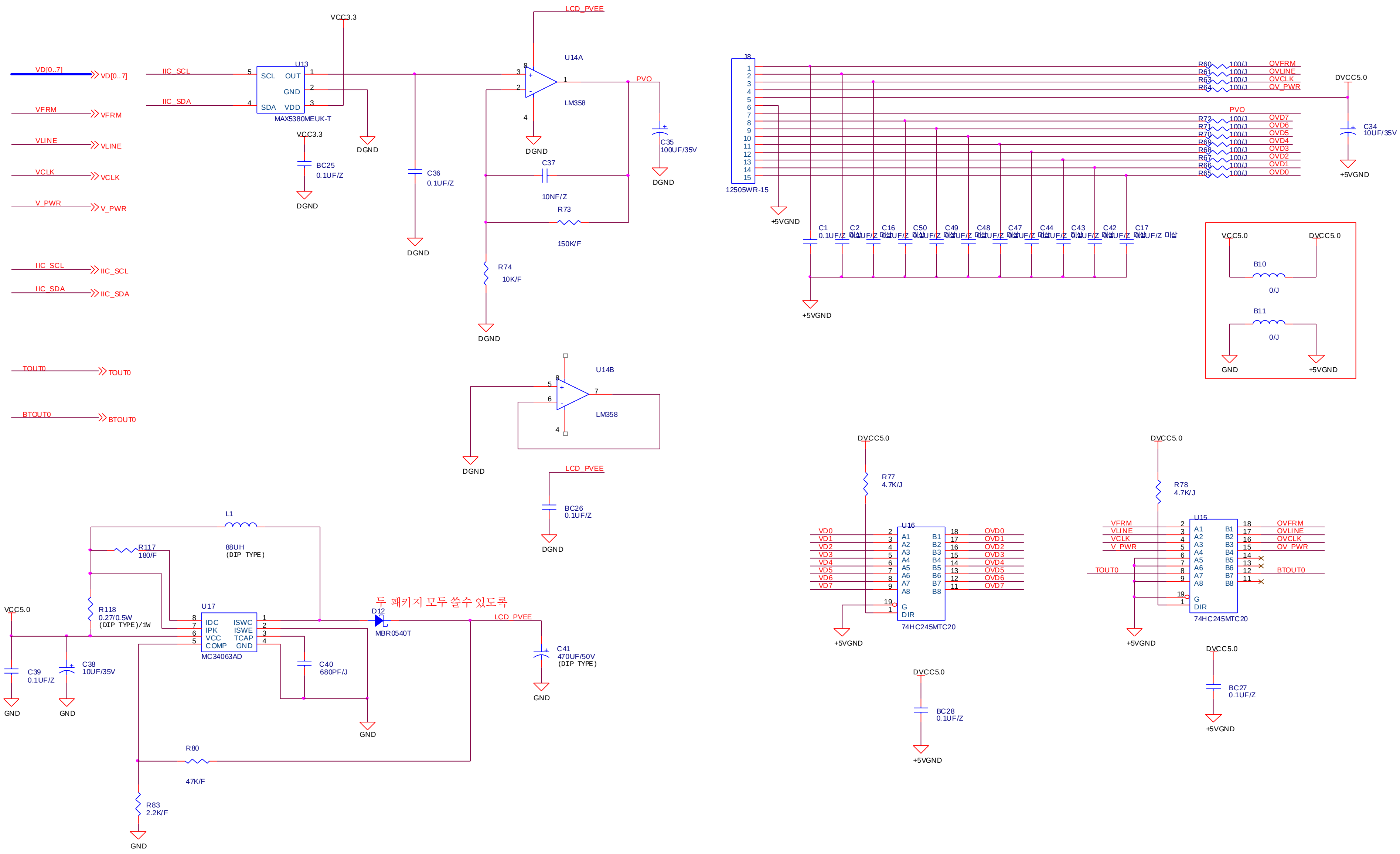
Revision A

Digital b/d, LAN part



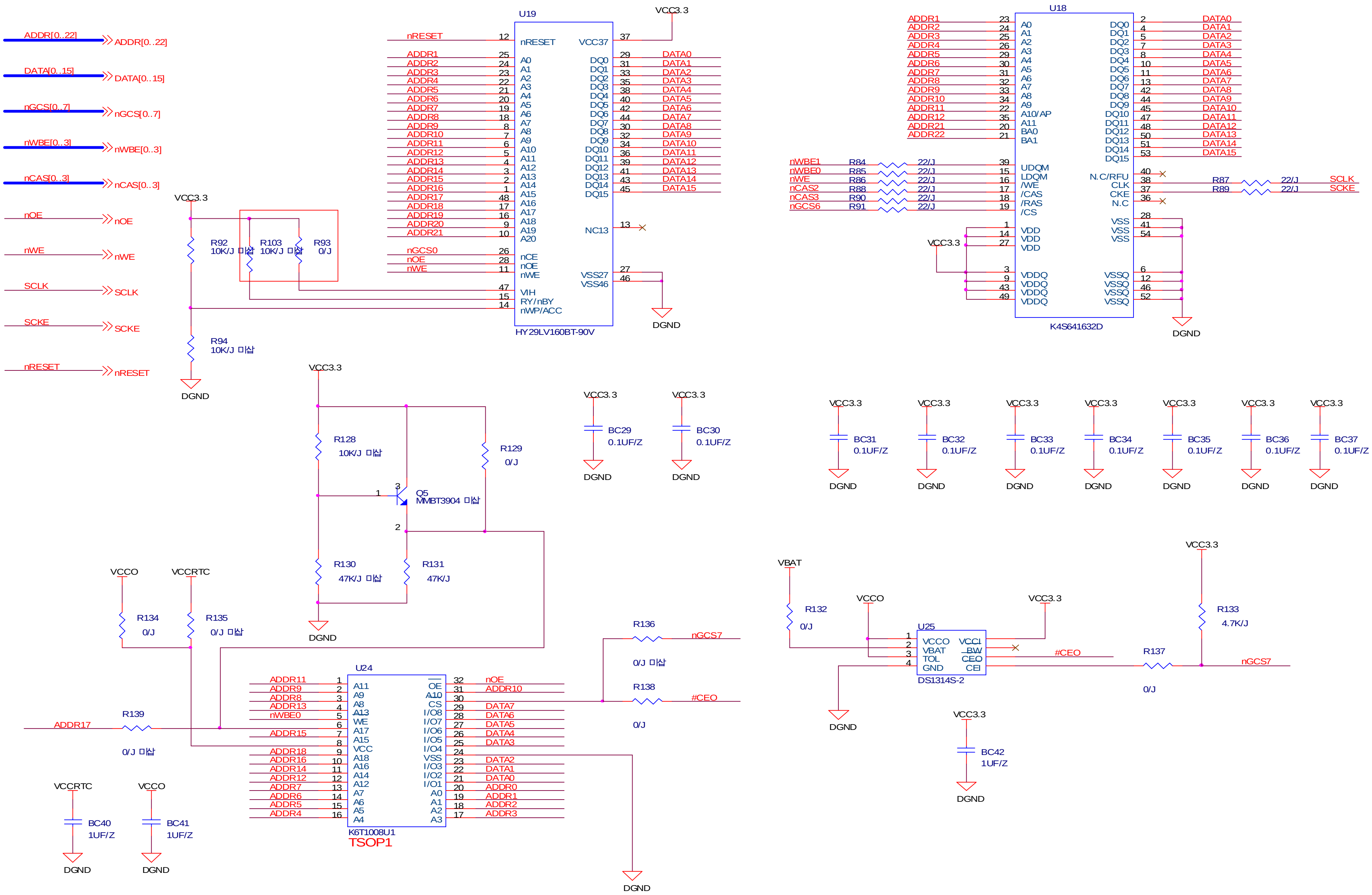
Revision A

Digital b/d, LCD connector part



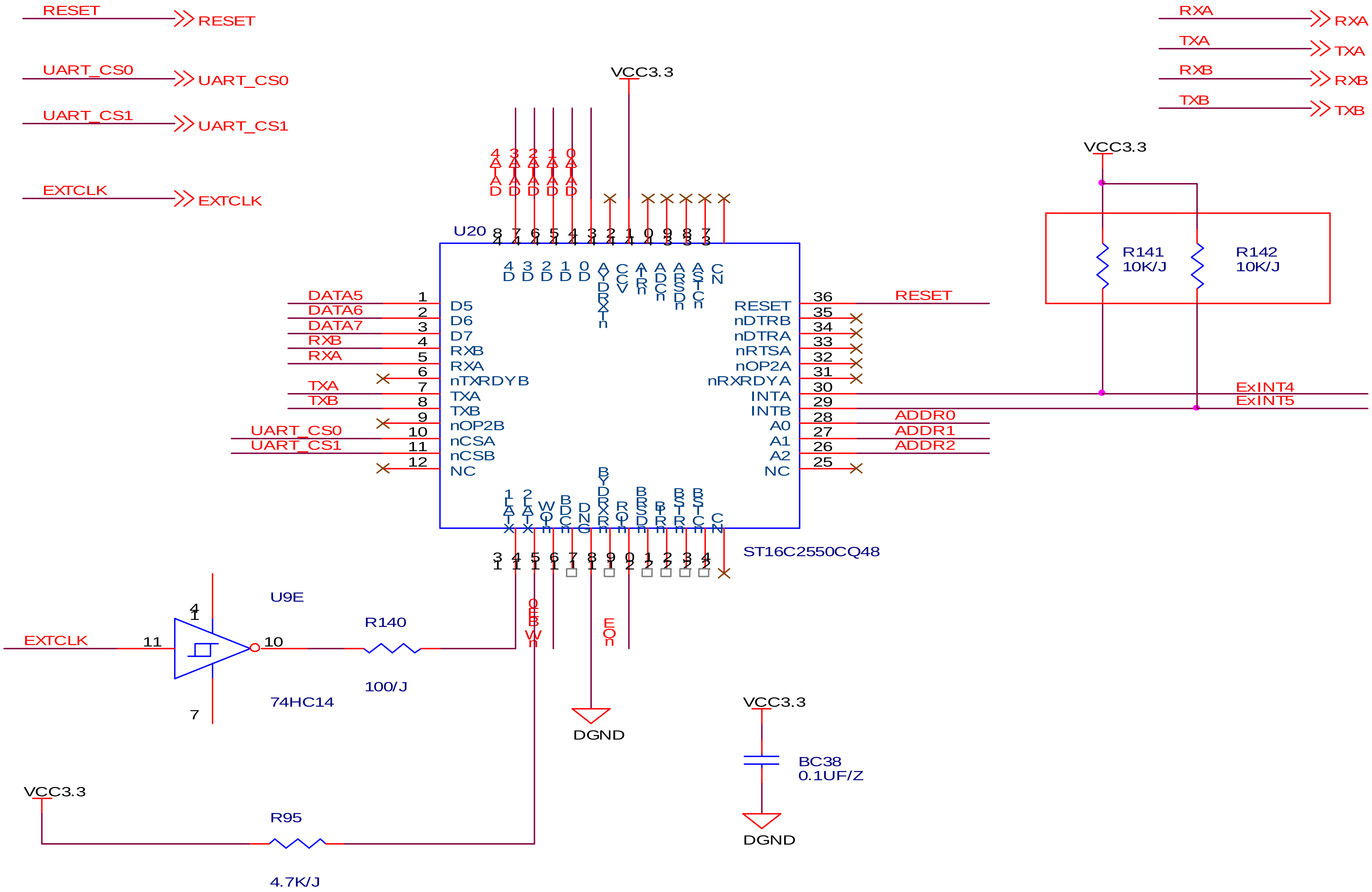
Revision A

Digital b/d, memory part



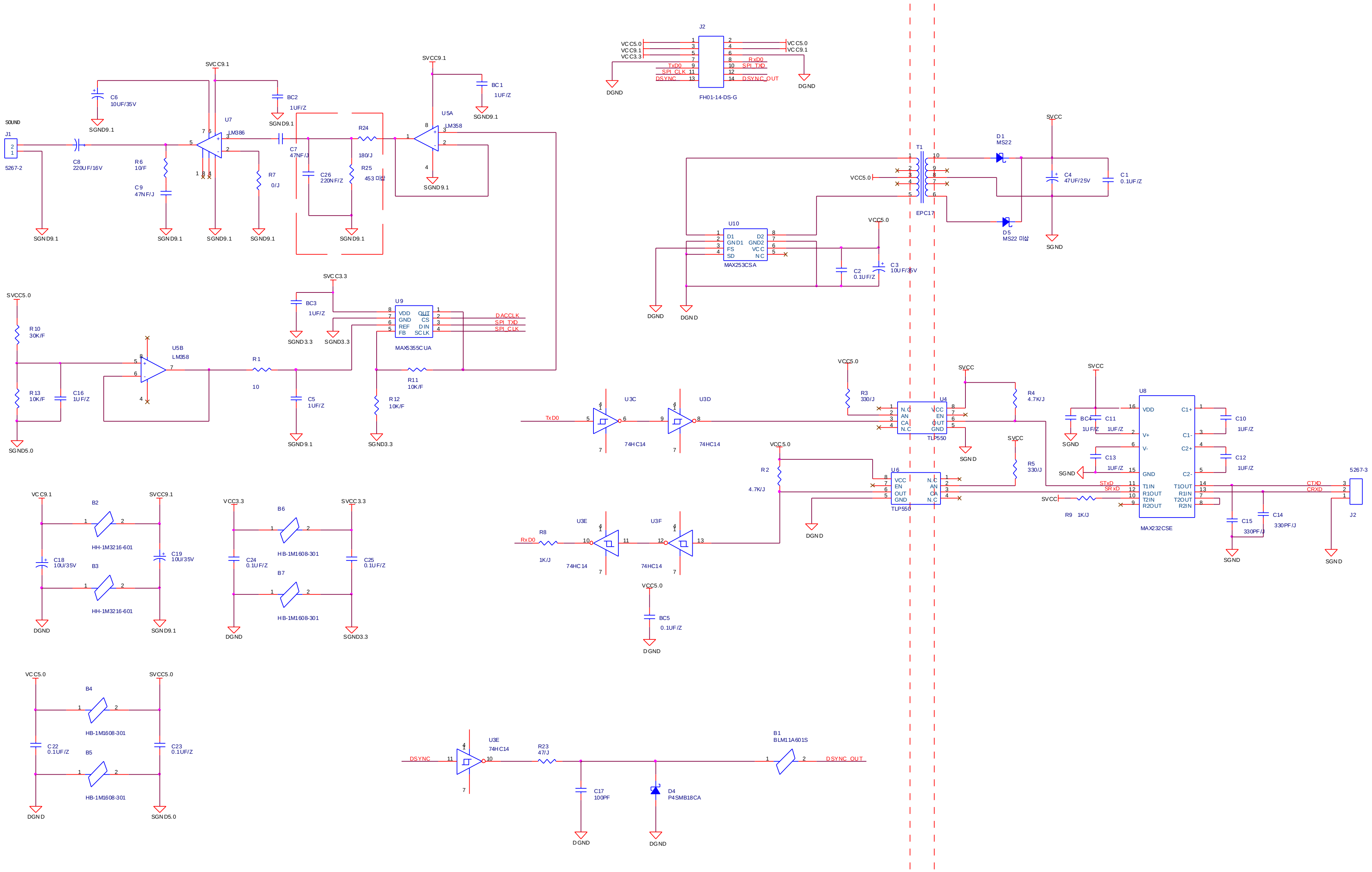
Revision A

Digital b/d, serial part

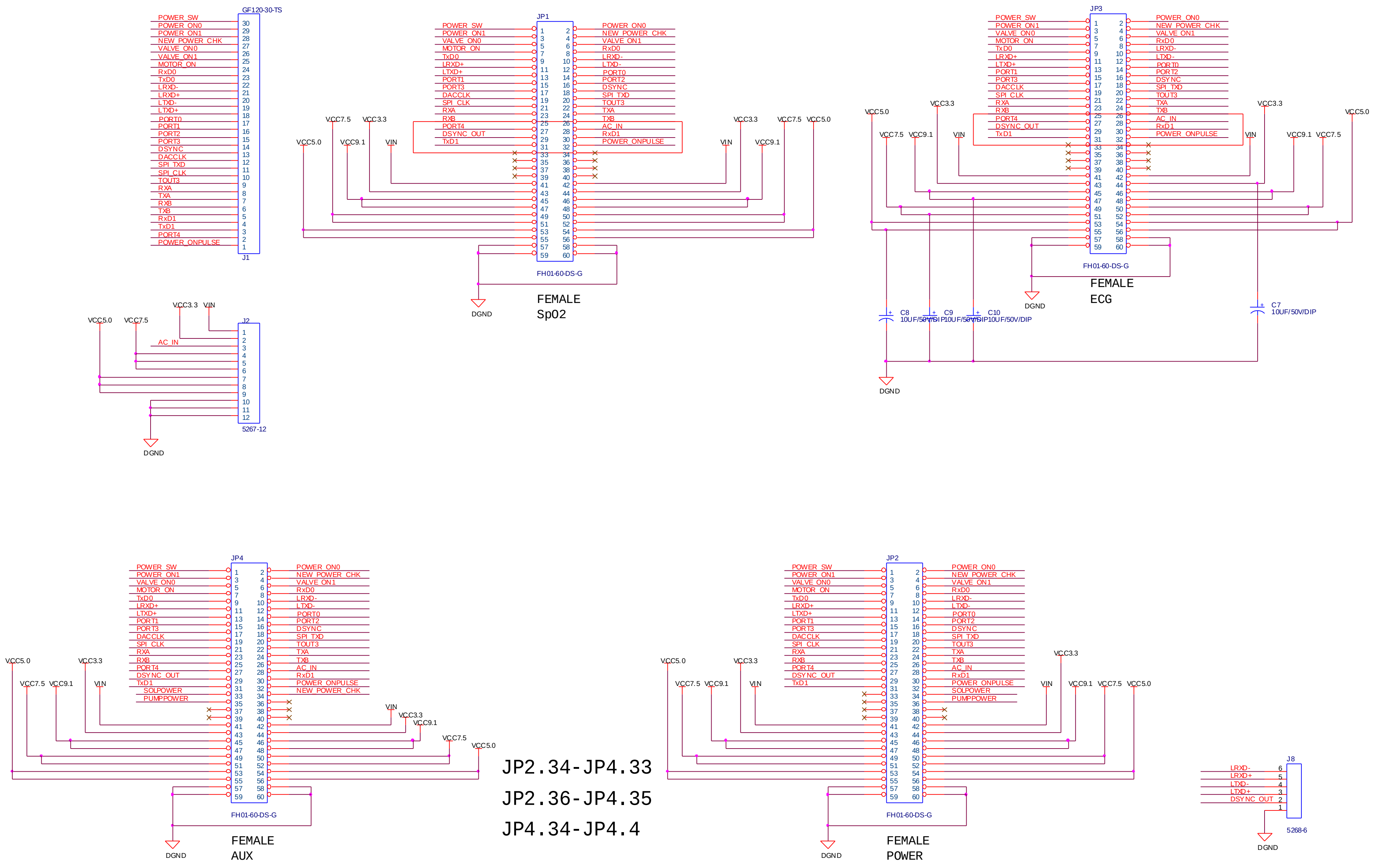


Revision A

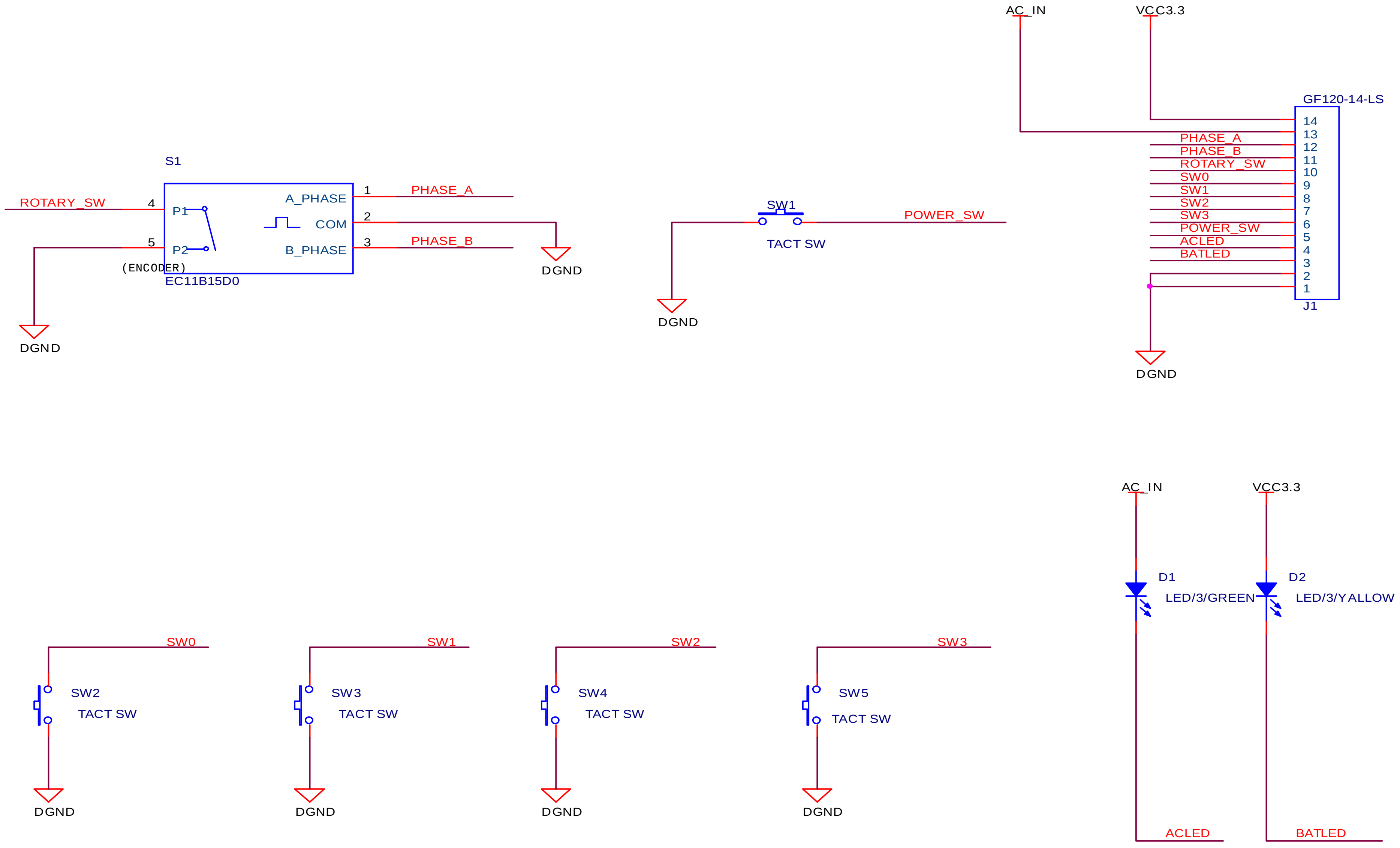
External B/d, Sound, serial part



Interface b/d

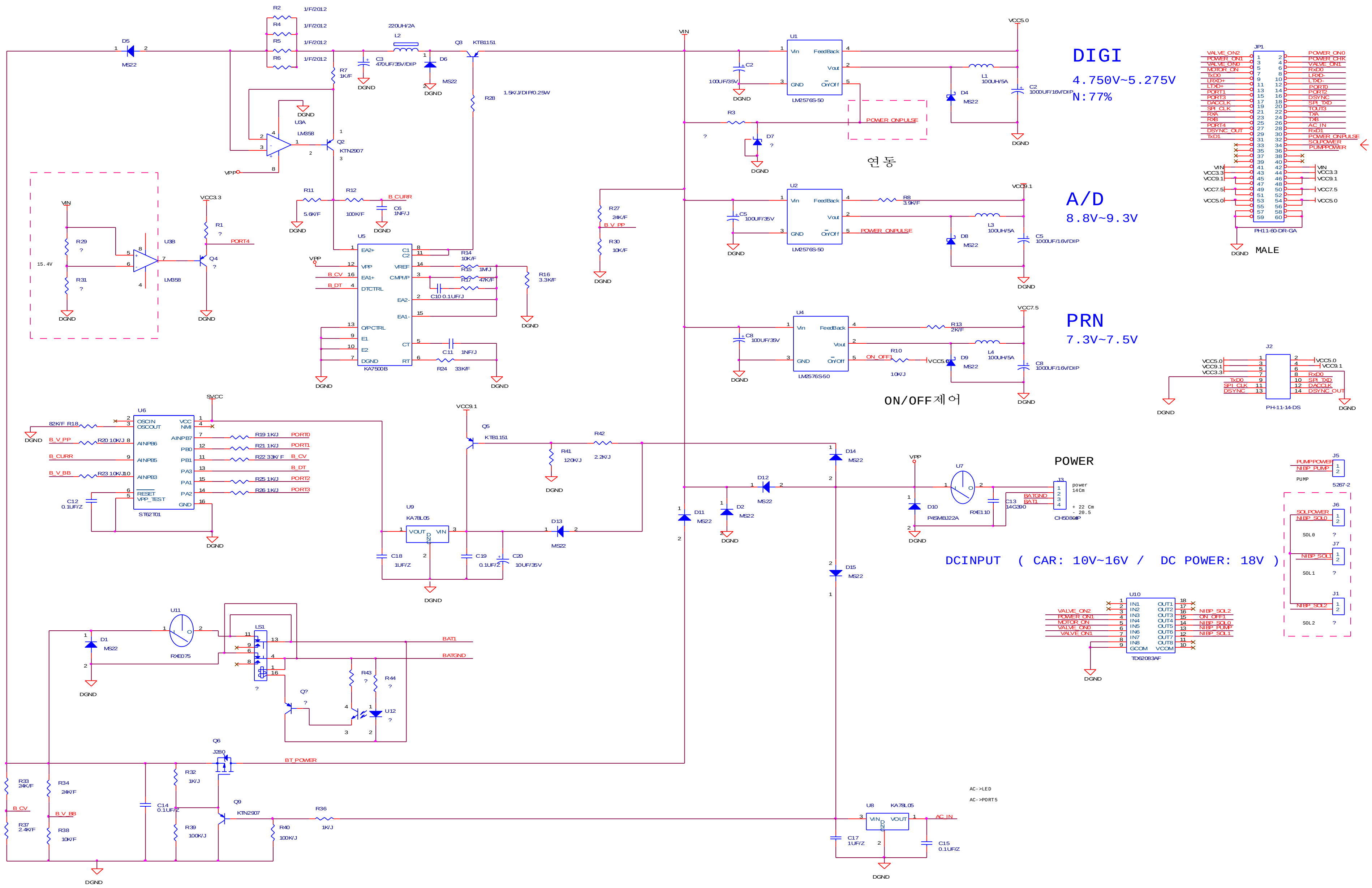


Key b/d



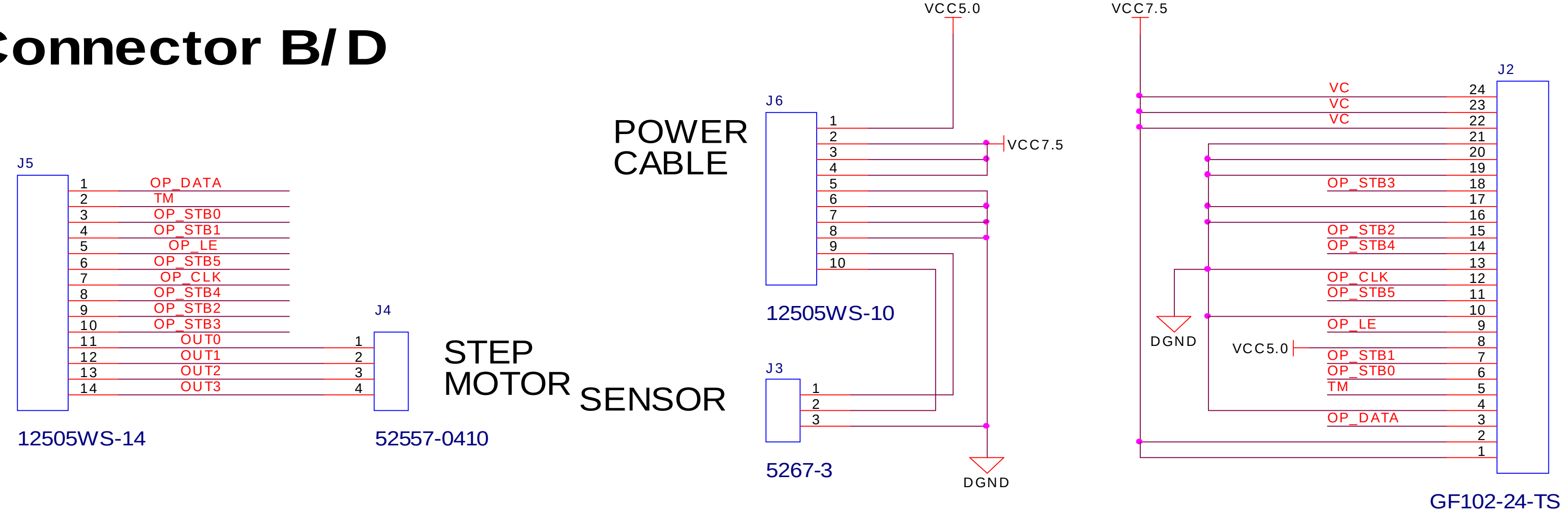
Revision A

Power b/d

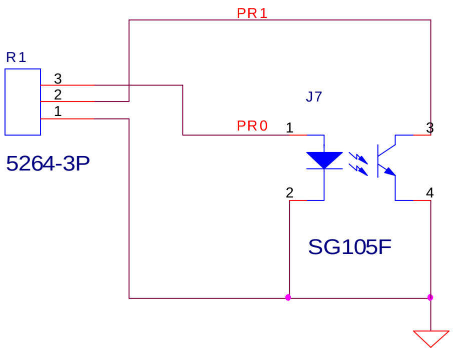


Revision A

Printer Connector B/D



Sensor B/D



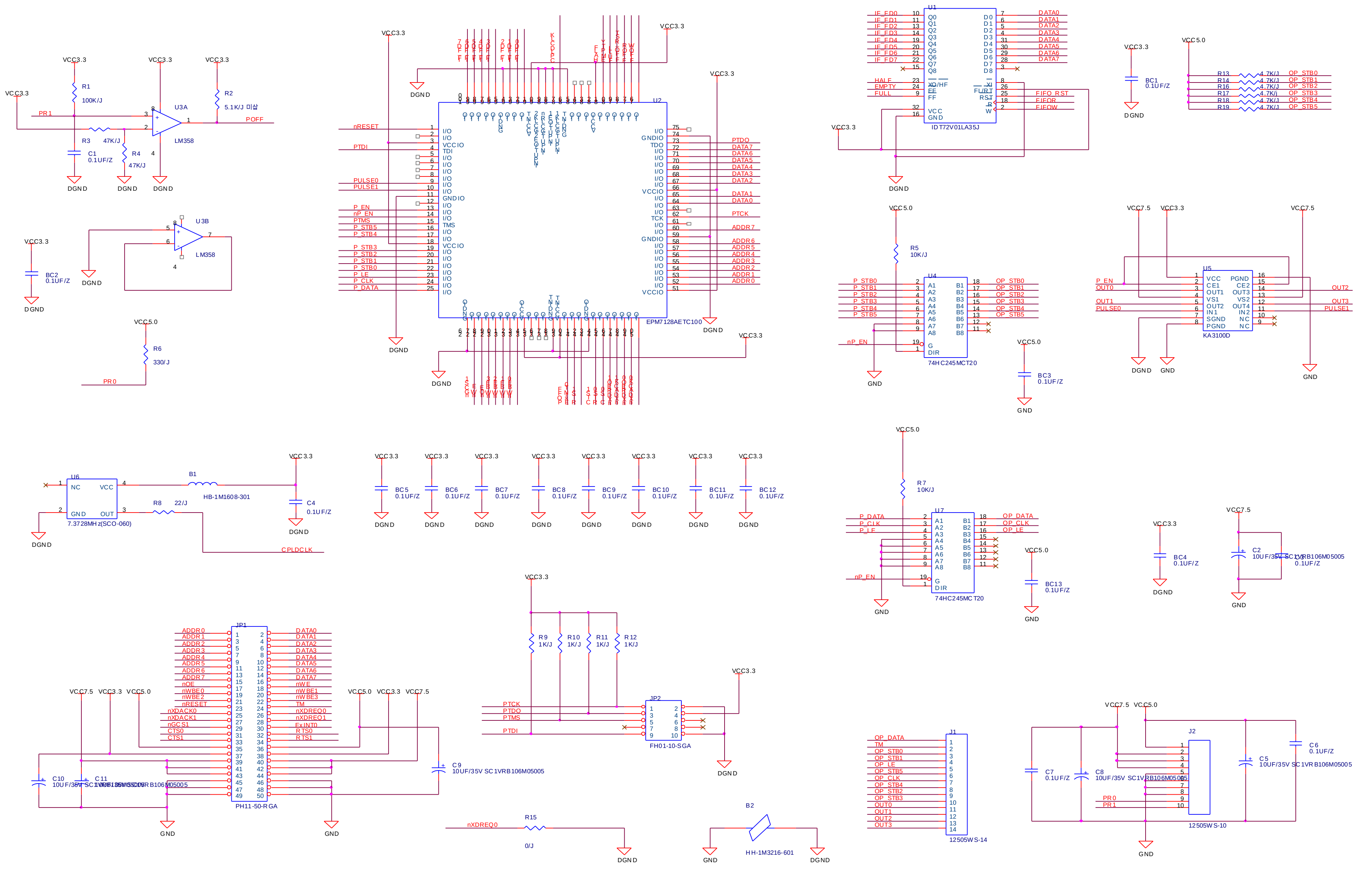
REV:
PCB-400-PCON-1

SENSOR : SG105F

STEP MOTOR:MGM- 01A

TPH: LJ048- 8R474 (AOI ELECTRONICS)
PCB : 두께 1.0 t

Printer b/d



Revision A

Safety b/d

